

MMOWGLI Game for Crowd-sourcing Counter-Piracy Solutions

Massive Multiplayer Online Wargame Leveraging the Internet

Don Brutzman

Modeling Virtual Environments Simulation (MOVES) Institute
Naval Postgraduate School



Web-based collaboration game for brainstorming ideas

Massively Multiplayer Online War Game Leveraging the Internet

mmoagli



Are there any other ideas that could be used to solve this problem?



DEFEND
What new risks could arise that would transform the Somali pirate situation?



COUNTER
Challenge this idea



NEW RISK
What new risks might be out there?



SUPER INTERESTING
Build less expensive ships, kinds that are in between the massive ships we have now and unmanned robot ships. Fast, Capable, Inexpensive, gm_116



INNOVATE
What new resources could turn the tide in the Somali pirate situation?

ADAPT
Take this idea in a different direction



EXPAND
Build on this idea to amplify its impact



MMCWGLI is a social-network tool for crowd-sourced brainstorming, sponsored by the Office of Naval Research (ONR) for the United States Navy. We built an innovative open-source Web engine to explore strategy development and expand community engagement in complex geopolitical problems.



Topics

What is the MMOWGLI game?

- Collaboration on stimulating topics
- Brainstorm ideas, build action plans, let's play!

How did we build it?

- Lots of open source software,
- Lots of testing and learning through practice

Conclusion: crowd sourcing is practical

- Lots of lessons learned, we are happy to share
- MMOWGLI support for more games forthcoming

Goal Outcomes



Establish Relationships

**Build “Community of Communities”
using MMOWGLI Game**

**Find Effective, Balanced Approaches
Against Piracy**

Who built MMOWGLI?

Credit where credit is due

Naval Postgraduate School

Diverse U.S. University

- 300 faculty
- 1500 students

Expertise in many areas

- Technical, political

International Students

- 300-350 active duty
- Many nations

Qualified naval officers
with experience in piracy



<http://www.nps.edu>

NPS MOVES Institute

Modeling, Virtual Environments, and
Simulation (MOVES) Institute

Masters and Ph.D.
programs

Independent research

Analysis, visualization,
networked VEs, Web



<http://www.movesinstitute.org>



THE MOVES INSTITUTE
NAVAL POSTGRADUATE SCHOOL

Sponsor

U.S. Office of Naval
Research (ONR)

Office of Innovation

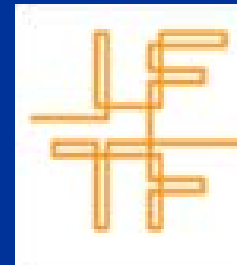


www.onr.navy.mil

Design Partner

Institute for the Future
(IFTF)

Palo Alto California



www.iftf.org

Organization

Departments

Directorates

Office of Innovation

- Innovation Network
- Innovative Naval Prototypes
- Lectures, Newsletters & Reports
- MMOWGLI
- SwampWorks
- TechSolutions

Office of Research

Office of Transition

ONR Global

Naval Reservists (P-38)

Contacts by Topic



Office of Innovation

Innovation Beyond Imagination (TM)

The Office of Innovation promotes, fosters, and develops innovative science, technology, processes and policies that support the Department of the Navy.

Our Mission

The Directorate of Innovation cultivates innovative science and technology approaches that support the Department of the Navy and facilitate rapid and agile responses to our changing national security environment.

Join Our Network

Are you an innovator? If you thrive on technological advancement and would like to network with ONR and other technology principals working to advance Navy and Marine Corps capabilities, [join the Innovation Network](#).

Building Collaboration

The Office of Naval Research and the Naval Research Laboratory meet weekly to increase situational awareness and build professional contacts across the Naval Research Enterprise. It's just one of many collaboration-building events

40 + 10 Years of Foresight

THE VISION

The **future** is everything we can imagine: the inspiring, the inexplicable, the essential. 40 years ago, our founders imagined a world in which it would be possible to **improve human lives and build better futures** by thinking systematically about the future. Today, we practice **Foresight to Insight to Action.**

- World at Large
- Focus on Health
- New Business Propositions
- Social Technologies
- Art of the Possible

CURRENTS OF FORESIGHT

Our imaginations have led us through four decades of world change and technological innovation.

Our founders were visionaries who saw the power of computers to build collective intelligence—and recognized the critical need for intelligence to planning for the future. They assembled expert opinions, tabulated cross-impacts, and modeled the results.

Still in our first decade, we factored in human communication. We became a tool not just for processing expert questionnaires but a platform for connecting experts in so-called invisible colleges to address the most complex problems of the day. Building the platforms and forecasting the impacts went

METHODS



40 YEARS

1968 Frank Davidson
1970 Olaf Helmer
1971 Roy Amara

1968

Frank Davidson

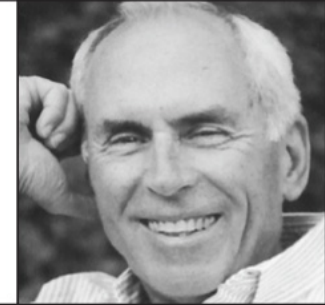
1970

Olaf Helmer

1971

Roy Amara

PRESIDENTS



In 1968, Institute for the Future was founded by Paul Baran,

Roy Amara initiates the program that will eventually become the Ten-Year Forecast

■ Invisible Colleges

GROUP COMMUNICATION THROUGH COMPUTERS
Jacques Vallee, with Bob Johansen, initiates the Ten-Year Forecast (TF) in its groundbreaking computer-based human communication



A role-playing game-in-a-box to make better choices about teleconferencing

Social Evaluation of New Technologies: Bob Johansen brings a sociologist's perspective to assessing new computer and communication technologies

Social Indicators: Gred Schmid leads the exploration of social indicators as a mathematical basis for planning and forecasting

Mathematical Modeling: Andrew Lipinski, Roy Amara, and Hubert Lipinski explore a range of mathematical modeling techniques to address issues from x to y

Simulation & Role Playing: Bob Johansen, Jacques Vallee, Kathi Vian, and R. Garry Shirts explore scenario-based simulations and role playing as futures learning tools

Scenarios & Vignettes: Bob Johansen, Kathi Vian, and Jacques Vallee work with novelist Rob Swigart to develop the craft of the futures vignette

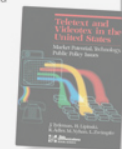
Survey Research: Andrea Sagan leads the Institute in applying research techniques to anticipate the future



Electronic Meetings
Bob Johansen, Jacques Vallee, Kathi Vian, 1979



THE HUB PROJECT: INTERACTIVE GROUP MODELING
Hubert Lipinski pioneers the computer science for group-based communication and distributed forecast modeling



Teletext and Videotext in the Wired Household
J. Tydeman, H. Lipinski, R. Amara, M. Nyhan, L. Zwimpler, 1982

■ The Wired Household

GROUPWARE BUSINESS TECHNOLOGIES
Bob Johansen initiates a long-running effort to develop computer-based tools for work teams

Game inspiration

There must be better ways of working together.

mmo wgli



massively multiplayer online war game leveraging the internet

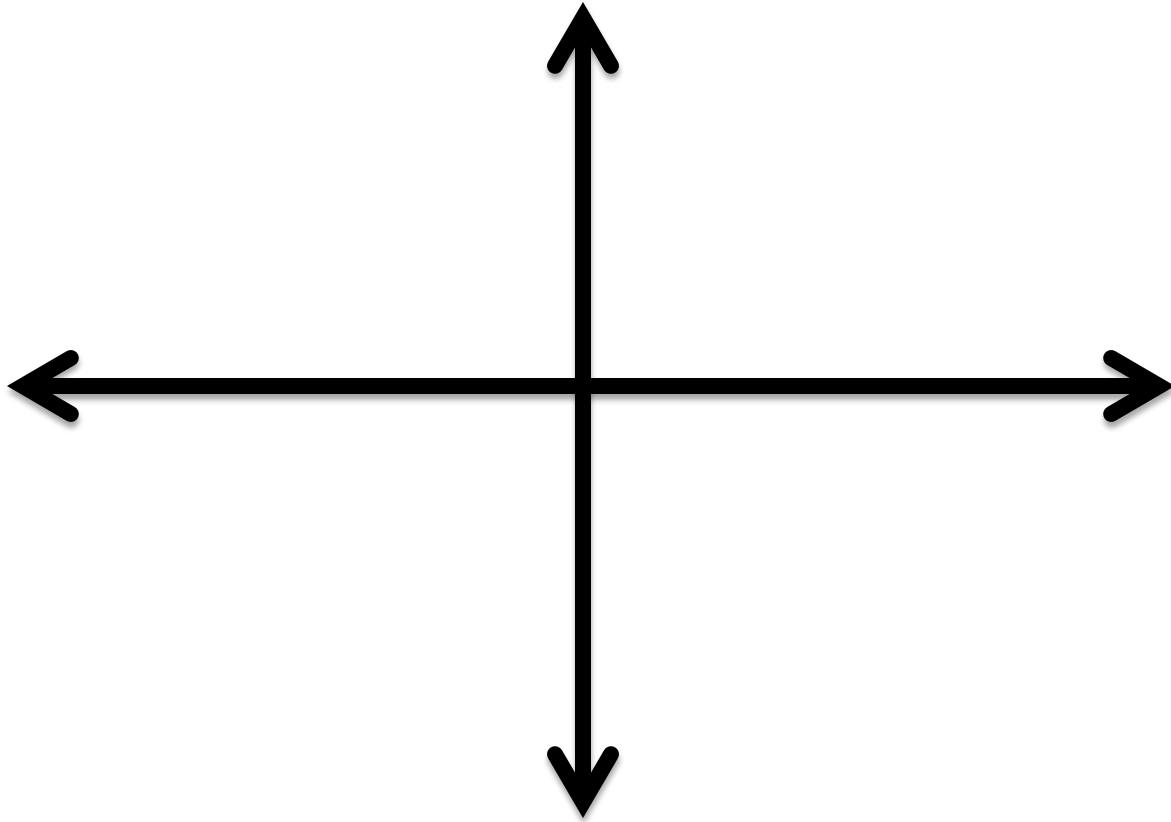
what is mmowgli?



Where is mmowgli?

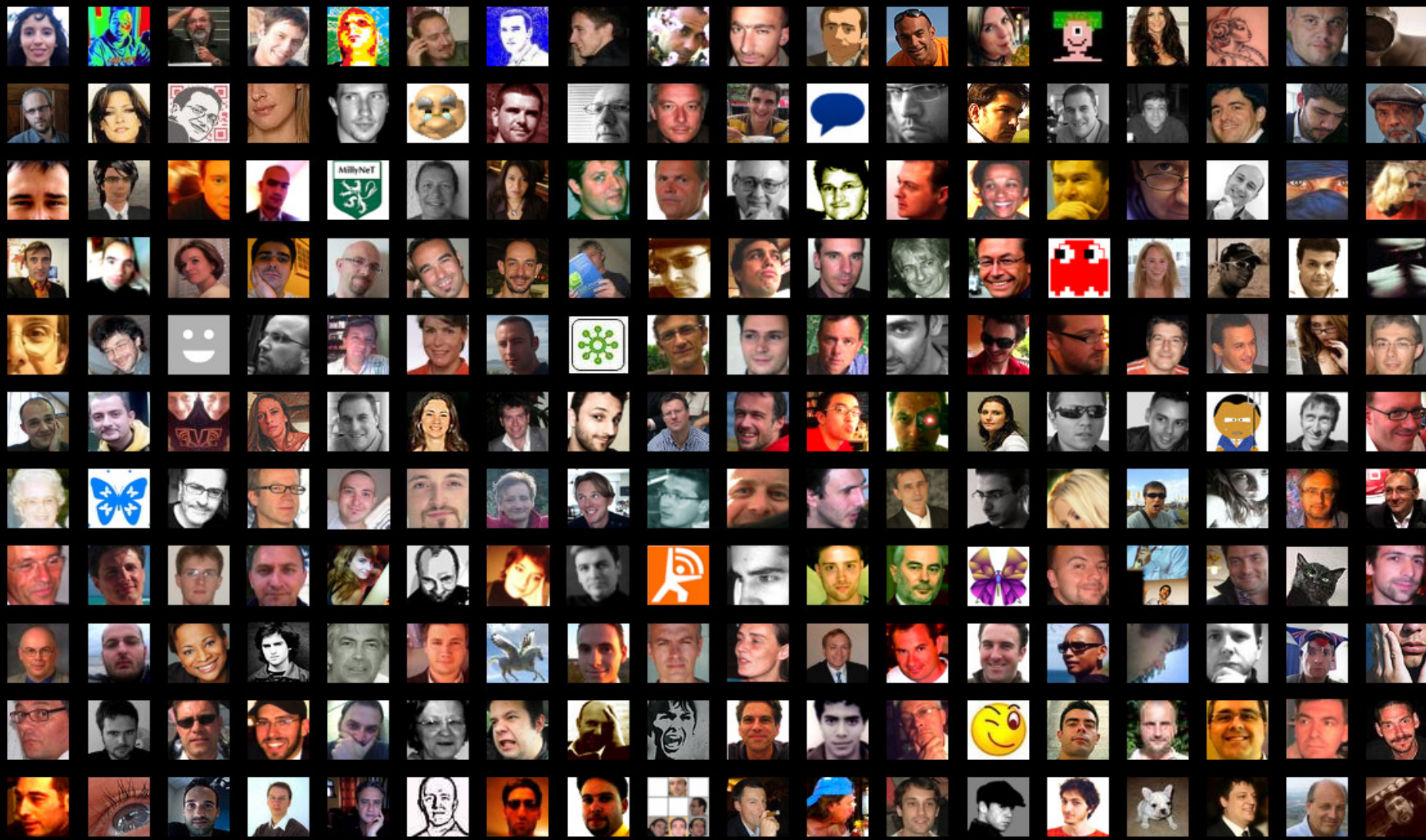
intellectual capital: “out there”

data

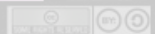


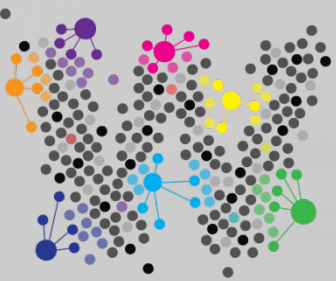
insight

intellectual capital: “in here”



scale & diversity of players





invisible hierarchy

It looks like you want to playtest an interactive geopolitical scenario!



Would you like...

- a 3-Move game?
- a Blue Team / Red Team?

Who is participating?

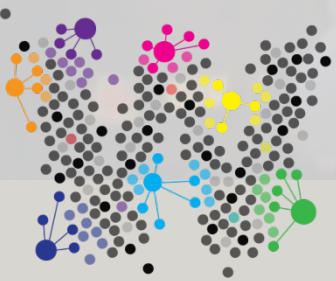
What are your goal outcomes?



repurposeable platform



knowledge accidents



designed with wicked problems in mind

Motivation

Some problems are wicked hard

Working together can uncover new solutions

Wicked problems

Wicked problems are difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize.

The term 'wicked' is used, not in the sense of evil, but rather its resistance to resolution.

Because of complex interdependencies, any effort to solve one aspect of a wicked problem may reveal or create other problems.

Piracy as a wicked problem

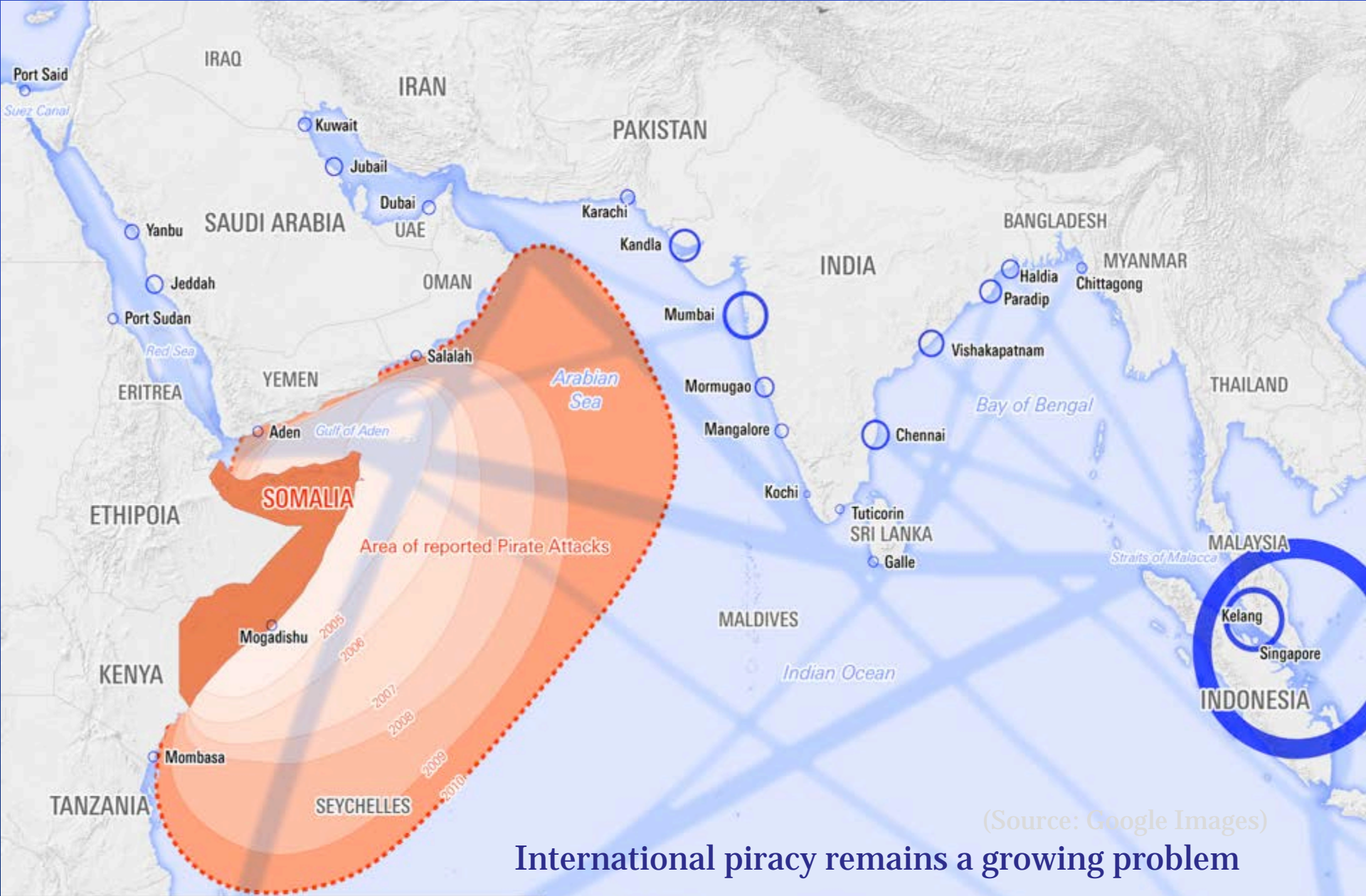
Has occurred for many centuries, thrives in ungoverned spaces between countries, resilient despite diverse attempts to resolve

Cuts across many communities of interest

- Naval, maritime, insurance, law enforcement, (inter) governmental, diplomatic, others

Can coordinated, comprehensive solutions help?

- Hard to say without dialog among stakeholders



International piracy remains a growing problem



Somalian Piracy
Threat Map (2005-2010)

Major Shipping Route
 Major Port
 50 Million Tonnes handled / year
 Extent of 2010 Pirate Attacks

Data Sources:
 Attack Locations: <http://www.eaglespeak.us/2010/10/short-review-expansion-of-somali-piracy.html>
 Port Data: http://en.wikipedia.org/wiki/List_of_world's_busiest_ports_by_cargo_tonnage
 Shipping Routes: <http://www.wired.com/wiredscience/2010/01/global-shipping-map/>
http://en.wikipedia.org/wiki/List_of_ships_attacked_by_Somali_pirates
http://commons.wikimedia.org/wiki/File:Somalian_Piracy_Threat_Map_2010.png
 cc-by-sa Arun Ganesh, National Institute of Design Bangalore
<http://j.sp/ArunGanesh>

Root Causes of Somali Piracy

Regional Instability

Indian Ocean
Tsunami 2005

Terrorism
(Al-Shabaab)

Other African
Interests

Famine

Poverty

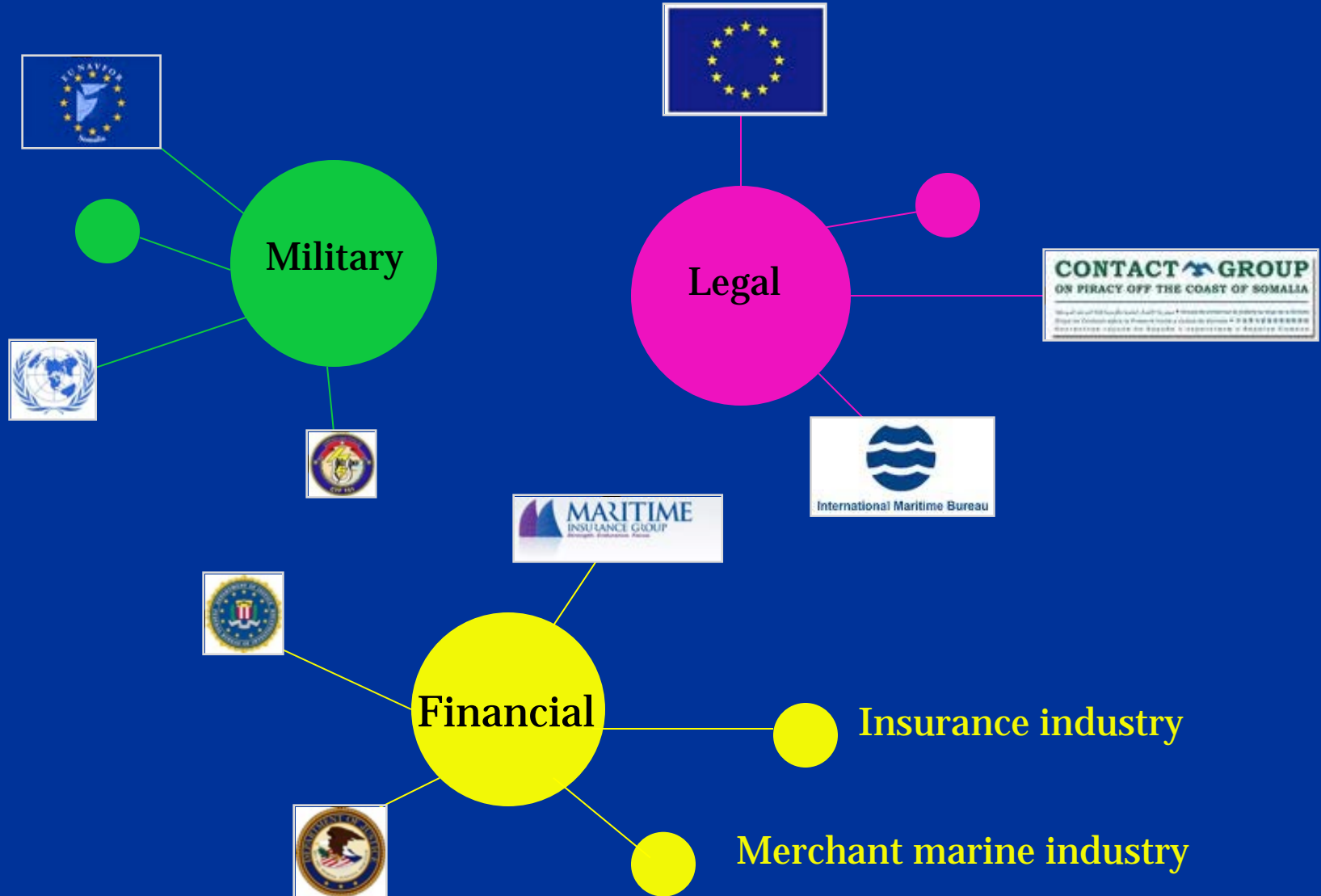
Weak governance

IUU Fishing

Failed
Foreign Policies



International Response: Separate Communities of Stakeholders



Problem Statement

Somali piracy is complex

Existing methodologies are hampered by compartmentalization among various stakeholders, and have yet to provide a comprehensive approach.

Is piracy always a “wicked problem” that rapidly changes to defy all solutions?



Or, a bigger problem that needs multiple communities to build cooperative solutions?



Current Costs of Complexity

No diversity of solutions

Limitations

Money

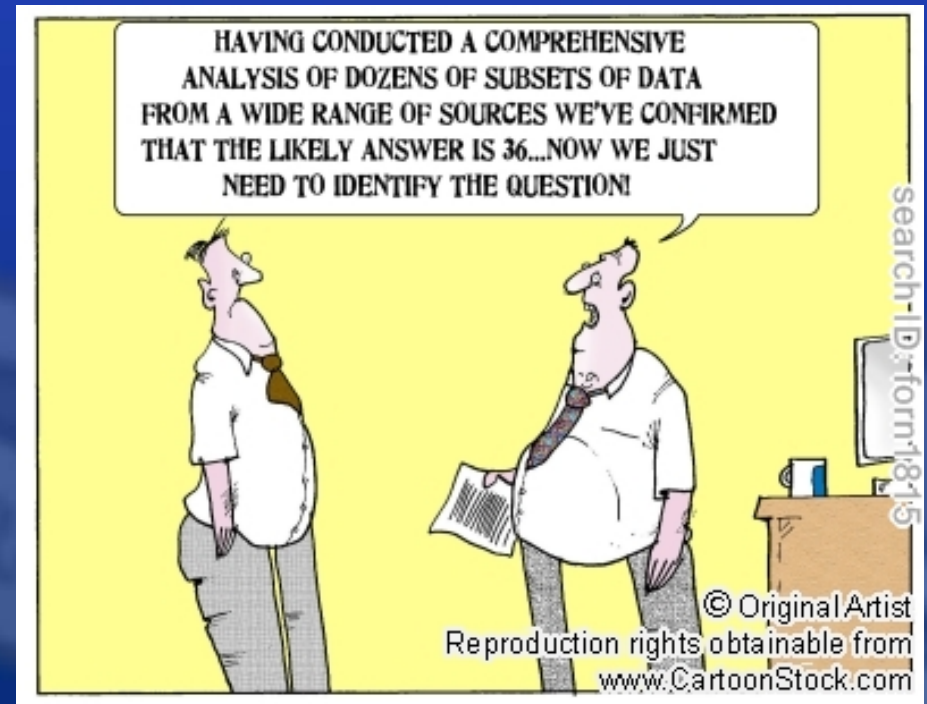
Mobility

Bureaucracy

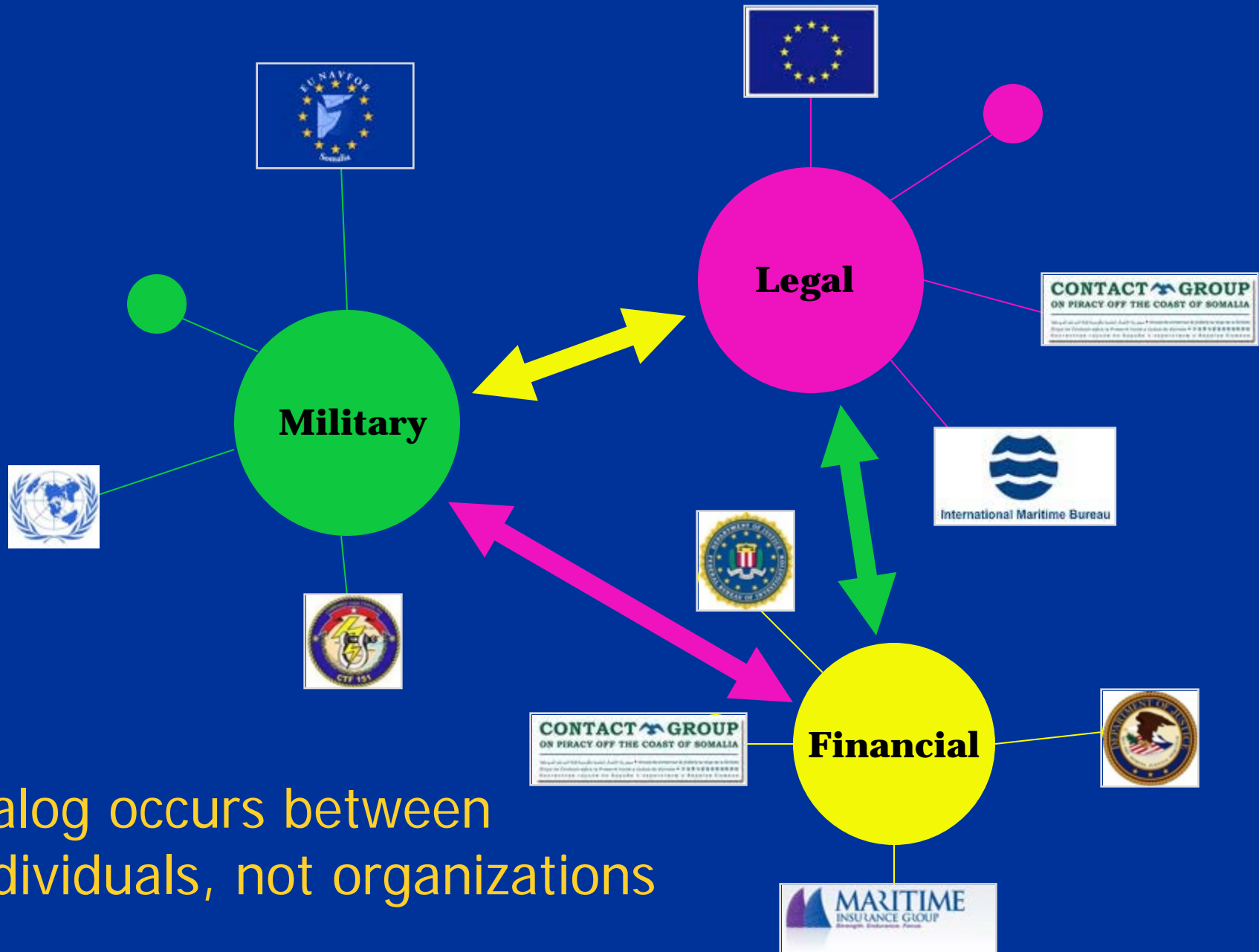
Conference fatigue?!

Pirates are beaten?!

Few meaningful changes in root causes of piracy



What if... better dialog was possible?



dialog occurs between individuals, not organizations

How can we collaborate?

These communities of interest are different

- Naval, maritime, insurance, law enforcement, governmental, diplomatic, others...

Participants are not always incentivized to share

- Sharing economic considerations might reveal a competitive advantage or even tactical weakness
- Collaboration is time consuming and difficult

Can social networking tools help us go beyond challenges to work together effectively?

How to get where we need to go?



What is in the MMOWGLI game?

Participant registration

Call to Action

Idea brainstorming

Action plan generation

What is it, how does it work?

The MMOWGLI game is designed to let groups of anonymous people remotely work together on generation new ideas and action plans

Players can establish their own "game persona" while keeping their identity private

MMOWGLI game plays in any Web browser, so no software installation is ever required

Game products are collected, published online

emergent engagement
platform novel network
online challenge experts
outliers emergent intelligence game
repurposeable barriers To Entry
narrative Incompleteness
massive collaboration
collective intelligence simulation
insight
open democratizing Innovation immersion diverse
Red Teaming scenario intellectual
wargaming scale knowledge Capital
complex Accidents

Design Goals of Piracy Games

2011.1 - open

- Can we brainstorm ideas together to fight piracy?

2011.2 - open

- How to transition from playing Idea Cards towards team collaboration on Action Plans?

2011.3 - open

- What Action Plans can players build together?

2012 - private

- Building a community for long-term collaboration

Stages for how the game works

New user registration

- Can login to observe: user *guest* password *guest*

Call To Action

- Getting motivate on the key issues of interest

Idea Cards

- Thinking as a group, exploring new ideas

Action Plans

- Translating ideas into actionable paths forward

New user registration

Let players keep their actual identities private while speaking openly in community space

- Privacy for personal security and independence
- Opinions unbiased by corporate policy or bosses
- Defuse possibility of personality-based arguments

Players create a game persona for others to see

- Establishes frame of reference for their experience and goals
- This is a “serious game” after all

User agreement terms and conditions

User Agreement

cancel

I confirm my willingness to meet game requirements:

First, I confirm that I am at least 18 years of age, I have been informed of risks and benefits, and I consent to participate.

[Read](#) *Informed Consent to Participate in Research*

Second, I understand that **no classified or sensitive information can be posted** to the game since participation is open. Violation of this policy may lead to serious consequences.

[Read](#) *Department of Defense Social Media User Agreement*

Third, the official language of the MMOWGLI game is English. Other languages are not supported in order to ensure that player postings are appropriate.

reject, no thanks

accept and continue

We don't need much to get you started.

cancel

Game play for this session of mmowgli is restricted to invited users with a previously-registered email address.

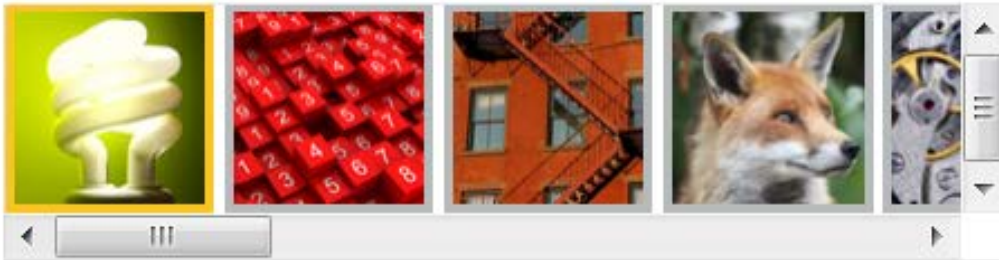
Please choose a game name (ID) that protects your privacy.

Pick a game name (ID)

Password *

Confirm password *

Choose an avatar image:



The following information is not revealed to other players

First name *

Last name *

Email address *

* private information (encrypted in database)

continue

New user registration

Some fields are private, while other fields are observable by other players

Additional information requests

Tell us about you

cancel

Affiliation category and location are optional and are displayed to other game players.

Affiliation:

Location:

These fields are optional. Please be careful that the combination of player ID, affiliation and location do not reveal your actual identity.

continue

Last Step: tell others of your interests

cancel

This optional information is revealed to other players.

Enter a short description of your pertinent expertise.

What do you hope to change about Somali piracy?

(optional, but worth 10 points if you answer)

I agree to receive private email during game play.

I agree to receive private in-game messages during game play.

OK great, thanks for registering! Let's play.

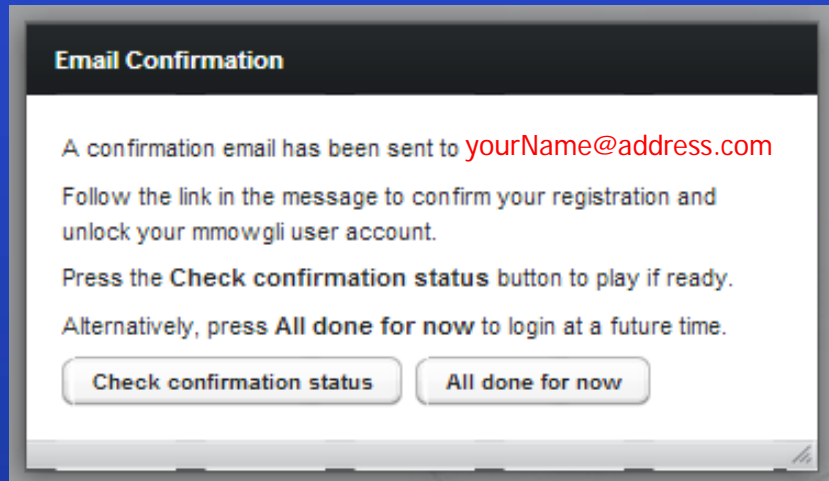
Get a briefing

E-mail confirmation

E-mail confirmation

- Provides confidence in player identity
- Prevents masquerading as another person
- Allows filtering to specific audiences
 - for example, counter-piracy professionals
- Discourages potential spam or other abuse

Once player responds, a new account is unlocked



Registration confirmation



Your email address is confirmed. Thanks for joining *mmowgli* / *Piracy2012*!

If you have the *mmowgli* "Email Confirmation" dialog still visible in your browser, you may click the "Check confirmation status" button to begin game play.

Alternatively, visit <https://mmowgli.nps.edu/piracy> to login with the game name and password you chose.

Problems may always be reported on the [MMOWGLI Trouble Report](#) page at mmowgli.nps.edu/trouble, or by email to mmowgli-trouble@movesinstitute.org

More information is also available on the [MMOWGLI Portal](#).

Thanks for your interest in playing *mmowgli*. Play the game, change the game!

HansonWade2012 Sign Out

YOUR POINTS

EXPLORATION: 10
IMPLEMENTATION: 0

Search

User Profile

PLAYER PROFILE

NAME

HansonWade2012

LEVEL

Player

[Change Password](#)

[Receive external email](#)

[Receive in-game mail](#)

[Change email](#)

[Send yourself test mail](#)

LOCATION

London England

AREAS OF EXPERTISE

Session moderation to discuss group plans for progress

PIRACY ROLE TO CHANGE ABOUT

Can different groups of counter-piracy stakeholders collaborate using the MMOWGLI game?

BADGES & AWARDS



You are now logged into the game!



HansonWade2012 Sign Out

YOUR POINTS

EXPLORATION: 10
IMPLEMENTATION: 0



Search

piracy
mmoagli

Leaderboard

Map

Game Blog

Learn More

PLAY AN IDEA

TAKE ACTION

We are exploring why pirate attacks have decreased.

Is the Current Counter-Piracy Framework Effective?

Share More info

8 lines of effort were identified and assessed:

Naval Operations	→	Navies successfully lowered piracy success rates through disruption in specific areas. Navies have also prevented any hijack of WFP or AMISOM vessels. However, the number of attacks has increased every year and remains at record levels.
Vessel Self-Protection	→	Increased Employment of Best Management Practices and use of private security have reduced risk. Increased BMP compliance, transparency in reporting, and cooperation (e.g. IRT) would further help reduce risk.
Messaging Campaign	→	Coordinated messaging limits effectiveness across several lines of effort. Coordinated media messages as well as locally tailored messaging to the piracy and diaspora.
Regional Response	→	Regional capacity building has achieved initial gains in Maritime Situation Awareness. International efforts are now better coordinated through the TRADE mechanism. However, the multiple regional efforts would benefit from being better coordinated.
Rule of Law	→	Prosecution and incarceration has increased – over 1000 pirates detained across 20 jurisdictions. However, current focus on prosecutions of “foot soldiers” capacity issues. Nations’ willingness/ability to prosecute lags behind naval operations.
Coordination Process	→	The Contact Group has established itself as the focal point for institutional counter-piracy efforts. However, international efforts would benefit from more mandates and more continuity of leadership within the Contact Group.

Call To Action!

Welcome Maritime Experts

Somali piracy is a serious international problem that affects many nations, industries and individuals. During 2011, many people from the general public played the [Piracy MMOWGLI games](#) to explore how to best combat piracy. Latest game news is found on our [Piracy Blog](#).

Now it's time for counter-piracy professionals. Current agreements for naval operations, regional capacity building, and strategic messaging expire at the end of 2014. What are our priorities? Our transition options? International experts are joining together to build a community, brainstorm good ideas, and collaborate on action plans. We will examine and challenge the work produced by [Oceans Beyond Piracy](#) in their [Independent Assessment Report](#).

Our new Line of Effort is **Regional Capacity Building**. Please spend ~30 minutes weekly to contribute. Play the game, change the game!

Play an idea: is the piracy slowdown temporary?

Call to Action



Problem statement to focus and motivate players helps everyone work towards a common goal



Call To Action!

Welcome Maritime Experts

Somali piracy is a serious international problem that affects many nations, industries and individuals. During 2011, many people from the general public played the [Piracy MMOWGLI games](#) to explore how to best combat piracy. Latest game news is found on our [Piracy Blog](#).

Now it's time for counter-piracy professionals. Current agreements for naval operations, regional capacity building, and strategic messaging expire at the end of 2014. What are our priorities? Our transition options? International experts are joining together to build a community, brainstorm good ideas, and collaborate on action plans. We will examine and challenge the work produced by [Oceans Beyond Piracy](#) in their [Independent Assessment Report](#).

Our new Line of Effort is **Regional Capacity Building**. Please spend ~30 minutes weekly to contribute. Play the game, change the game!

Game design: preparing a Call To Action video

Multiple options

- Prepare a slideset (i.e. storyboard) description and then animate it
- Video interview with key leader describing what needs to be accomplished
- Detailed video scenarios telling a story

Key attributes: motivation and clarity about the problem of interest, for all potential players

Piracy Call To Action videos

See [Piracy MMOWGLI Games](#) for details and links

2011.1
fictional



2011.2
fictional



2011.3
fictional



2012
actual



Idea Cards

Each Idea Card is 140 characters of text

- Any subject, one or two sentences
- Suitable for any web platform (someday mobile)

Players get to “say what they think”

- Long enough to be meaningful
- Short enough to encourage clear thinking on one point at a time

Point/counterpoint dialog creates thoughtful
Idea Card Chains on meaningful topics

Top-level idea cards focus dialog

PLAY AN IDEA

Play an idea: is the piracy slowdown temporary?

how to play

CHALLENGES

How can we improve our partner efforts and best practices today?

FUTURE GOALS

What counter-piracy cooperation is needed after 2014?

go to Idea Dashboard

Challenge Cards

CHALLENGES 353 ★ Coastal States in the High Risk Area need to do more to protect merchant shipping. SeedCard 08/29 06:29 PDT	CHALLENGES 354 ★ At least 20% of vessels in the High Risk Area are not compliant with Best Management Practices (BMP). Compliance of BMP should be SeedCard 08/29 06:30 PDT	CHALLENGES 361 ★ Why has recent piracy activity dropped during summer 2012? SeedCard 09/17 10:16 PDT	CHALLENGES 362 ★ How can we ransom, rescue or release hostage ships and crews? SeedCard 09/17 10:17 PDT
--	---	--	---

oldest newest

Future Cards


FUTURE GOALS 355 ★ Protection of vessels is a responsibility of Flag and Trading Nations. PCASP should not be institutionalized. SeedCard 08/29 06:33 PDT	FUTURE GOALS 356 ★ BMP is an industry self-regulation guide – and each ship should only be subject to specific Ship Security Plans. SeedCard 08/29 06:33 PDT	FUTURE GOALS 357 ★ Insurance companies should better incentivize vessels to comply with Best Management Practices (BMP). SeedCard 08/29 06:34 PDT	FUTURE GOALS 363 ★ How can counter-piracy forces keep pirate activity at this lower level? SeedCard 09/17 10:21 PDT
---	--	---	---

oldest newest

Idea cards have 4 types of response

DEFEND ★

What if radical elements or rogue states "contract" pirates to deliver chemical, nuclear, or other banned products to terrorist?

 Taco 05/27 06:02 PDT

[Edit Card](#)

- Super-Interesting
- Scenario Fail
- Common Knowledge
- Hidden

[clear card marking](#)

go to Idea Dashboard

View card chain

EXPAND

Build on this idea to amplify its impact

EXPAND ★

Not necessarily directly related to piracy - more of an expansion of the business base to include smuggling.

Taco 05/31 05:58 PDT

COUNTER

Challenge this idea

COUNTER ★

Radicals would be going out of their way to contract pirates. It would be easier to use a trusted source for smuggling, one of their

erwin 05/27 12:08 PDT

ADAPT

Take this idea in a different direction

EXPLORE

Something missing? Ask a question

EXPLORE ★

i like this, but how do you see this happening? Would pirates deliver through hijacked ships? current skiffs/motherships seems

ekimraew 05/27 08:32 PDT

COUNTER ★

this builds on the idea that piracy is for monetary purposes. some have offered that they only pirate to replace income, need vs greed.

ekimraew 05/27 08:33 PDT

Thoughtful idea chains

INNOVATE

What new resources could turn the tide in the Somali pirate situation?



INNOVATE

What new resources could turn the tide in the Somali pirate situation?



DEFEND

What are the risks and how can they be mitigated?








































MOST RECENT IDEAS

INNOVATE

DEFEND

Super-active chains

Super-active chains are sets of cards that have two or more authors and four or more follow-on cards at two levels.

	CARD CONTENT	AUTHOR	CREA
▼ 	(3678) EPIC builds several Oil Rig like Platforms	 redsparow1	06/2 
▼ 	(3683) Tethered air balloon videos to oil platform	 starship123	06/2
▼ 	(3690) Perhaps we couple this with a blue force l	 redsparow1	06/2
▼ 	(3693) Over 99% of all unknown vessels will be il	 Finius Stormfroth	06/2
▼ 	(3666) WORST STRATEGY: A military led unilat	 redsparow1	06/2
▼ 	(3668) Re: military led unilateral YSU nation buil	 gm_Rachel	06/2
▼ 	(3676) This should be a State Dept, USAID and I	 redsparow1	06/2
▼ 	(3679) Work with Islamic Court Union (ICU) to for	 starship123	06/2
▼ 	(3688) Depends on where the popular support li	 redsparow1	06/2
▼ 	(3692) The ICU effectively collapsed in 2007, sor	 Finius Stormfroth	06/2
▼ 	(3627) 2014 should see innovation in non-lethal	 redsparow1	06/2
▼ 	(3630) dolphins identify ships without highly cont	 progressive thinker	06/2
▼ 	(3634) What is the range for dolphins? Could thi	 redsparow1	06/2
▼ 	(3663) Use the same principle but instead of dol	 progressive thinker	06/2
▼ 	(3627) 2014 should see innovation in non-lethal	 redsparow1	06/2
▼ 	(3630) dolphins identify ships without highly cont	 progressive thinker	06/2
▼ 	(3634) What is the range for dolphins? Could thi	 redsparow1	06/2
▼ 	(3659) Robotic swimmers tasked to certian areas	 progressive thinker	06/2

Search

Idea Cards
Action Plans
Players

Search for Cards, Action Plans, Users

Word root cloud

[arctic](#) [area](#) [base](#) [better](#) [build](#) [capabl](#) [commun](#) [cost](#) [creat](#) [data](#) [develop](#) [econom](#)
[effect](#) [expens](#) [forc](#) [fund](#) [global](#) [govern](#) [idea](#) [littor](#) [local](#) [look](#) [mission](#) [nation](#) [naval](#)
[navy](#) [network](#) [oper](#) [patrol](#) [peopl](#) [pirate](#) [possibl](#) [problem](#) [region](#) [requir](#) [ship](#)
[situat](#) [state](#) [support](#) [technolog](#) [threat](#) [uav](#) [us](#) [usn](#) [vessel](#) [water](#) [world](#)

Found 77

ITEM	CONTENT
Best Strategy 527	Back existing private sector efforts for a unified UN anti-piracy force. The private se
Counter 538	The main reason for piracy is that it provides more income than legitimate jobs. Wh
Expand 34	Use large network of low cost, persistent UUVs to cover a wide area. Monitor natur
Player 1083	ricklva, , USAF Wargamer / US Navy anti-piracy, U.S. Air Force
Player 1012	kauai4me, Washington, DC, Senior member of NRE and knowledgeable about Sor
Player 1269	hitch657, Washington DC, tracking piracy for effects on military cargo shipments, U
Player 1390	slothmaster, Phnom Penh, Years spent plotting first episode of space piracy., Acac
Player 1556	muschka, Prague, Czech Republic, AI student of game theory and maritime piracy,
Player 1018	ajhp, London, UK, Have written a Masters Thesis on Counter Piracy operations and
Action Plan 9	Expanding regional partnership initiatives and capacity building in Africa to combat
Action Plan 1	Action plans can help solve piracy problems: this plan provides example guidance
Action Plan 4	What laws and treaties need revised/updated for 21st century changes in politics, t
Action Plan 11	Scenario: pirates begin to influence local gov'ts as wealth & power increase



Action Plans

TAKE ACTION

Creation of thought-provoking Idea Card Chain can identify authors who might collaborate

- “OK folks, now tell us what you really think!”

Action Plan describes a possible path forward: the essence of who, what, when, where, how...

- Authors can take turns editing their plan
- Authors can chat to help collaborate
- Authors can add image, video, map annotations
- Players can rate (1-2-3 thumbs up) and comment



Card chains lead to Action Plans

ACTION PLAN DASHBOARD

How to Win the Action

Action plans

MY ACTION PLANS

NEED AUTHORS

All Plans

Click on this tab to see a list of all action plans which exist in the game. The other two tabs show lists of action plans filtered in various ways.

ID	TITLE	AUTHORS
1	Action plans can help solve piracy problems: guidance	gm_melody, gm_Rachel, gm_donb, gm_lucian
2	Naval blockades	Parabellum, gm_Rachel, gm_chad, gm_donb, i
3	Unmanned Vehicle Sentry	gm_dano, gm_donb, gm_donm, gm_garth
4	How to stop piracy by using unmanned vehicles	Mastermind, gm_Rachel, firefly2878, gm_dont
5	Establish an International Fusion Cell in the Region	mark.paytas, gm_donb, HotRod82, navarchus
6	Use of Convoys	nikonamscope, dieselpunk1, jersey, gm_garth
7	Long-term social change using the theme of shaming	gadfly, gm_donb, redsparow1, dieselpunk1, G
8	Manipulating Interests	Mastermind, gm_Rachel, Finius Stormfroth
9	How can the YSU govern itself without piracy?	gadfly, gm_Rachel, Ears McShane, dieselpunk1
10	How to bargain with YSU on fair passage tax?	aspizler, Ears McShane, dieselpunk1, mario 6!
11	How would a a peer-to-peer pirate patrol work?	gm_garth
12	Approach YSU with a plan to develop a system of cont	firefly2878, secund3r
13	New ways for transport through the region	gadfly, nikonamscope, GCReport
14	Pirates target unarmed vessels. Revert to the right to l	Mastermind, gm_donb, gm_luciano, gm_jenn, i
15	Develop Khat Industry Worldwide As Alternative to Pir	gm_Rachel, redsparow1, gm_garth
16	Exploiting New Opportunities to Transform the Political	Finius Stormfroth, gm_donb
17	Crowdsourcing of Data/Intel	gm_Rachel, Mastermind, progressive thinker,
18	Dolphins that identify highly controlled chemical tracer	pending
19	Investigation of shipping company employees and GP!	pending

ACTION PLAN: ID 6

Naval Quarantine of southeastern Somalia coast can prevent successful pirate capture and ransom of hostage victims and merchant ships.

RATE THIS PLAN:

Average Rating:



Your Rating:



[zero thumbs](#)

Action Plan Authors:

(invited in parentheses)

briefier
EdwardPreble
gm_becca
LawDawg
WillyRobert
(Finius Stormfroth)

[ADD AUTHOR](#)



[history](#)

[3 Comments](#)

[Add Comment](#)

EdwardPreble: Executing hostages and sinking ransomed ships can also occur while the ship is held at a pirate camp ashore. So it is always a pirate option. The difference in the situation is that pirate captors have no shore infrastructure at sea, no help from other pirates, no communications with the crime bosses, and no other exit (for themselves personally) besides capture by naval forces.

Just in:



The plan

TALK IT OVER

IMAGES

VIDEO

MAP

Authors, this is your workspace.

Describe your action plan here. Talk it over with your fellow authors in real-time or asynchronous chat. Add images, videos, or map annotations. Remember this is a team effort! So work with your teammates to come up with the best possible plan.

Need more information? Check our [help](#) page.

The 5 Basic Steps:

1. Start by entering a headline that captures the big idea.
2. Describe the basic plan in the

Who is involved?

Combined maritime forces and the merchant marine industry can cooperate directly. Large commercial ships above an agreed-upon tonnage (which are easily detected using AIS, radar or remote sensing) are considered to be commandeered against their will unless they have registered their intent to visit Somalia prior to approaching the 200nm limit.

[history](#)

What is it?

Naval forces can significantly reduce patrol and response requirements by establishing a naval quarantine on large merchant vessels along the southern Somalia coastline. Unless it has filed prior notification of intent, merchant ships approaching within 200 nautical miles of shore are considered pirate captives and in need of rescue. Naval intervention on the high seas can prevent captured ships from reaching pirate camps, where hostage ransom negotiations can take years to resolve.

[history](#)

What will it take?

Merchant ships within 200 nm of the Somali coastline are considered captured, and naval forces can intervene to prevent hostages being held ransom ashore. Needed: reporting mechanism for commercial ships to combined maritime forces. Other aspects of this simple plan fit well with current naval operations, simplifying detection of piracy capture. Pirates have no way to reinforce and are contained within the vessel until they surrender. International law then takes over.

Players can comment and rate plans

3. Make a list of the resources you need in the What Will It Take? box.
4. Outline the steps to succeed in the How Will It Work box. *Hint: Use your card chain as a starting place.*
5. Sum up the impact in the last box, How Will Change the Situation?

Click Save Changes often to make sure your text is saved. Click History to review previous versions.

Work fast. Work smart. Work together.
Good luck!

How will it work?

A quarantine makes it much more difficult for pirates to intercept shipping vessels by quarantining inbound vessels that have no reported interest in visiting Somalia. Blocking merchant ships from returning to shore prevents pirate crews from reaching further criminal support. Operating outside 200nm limits can avoid sovereign jurisdiction issues which otherwise discourage intervention.

[history](#)

How will it change the situation?

Reduced cost and greater effectiveness for naval forces. Reduced risk and greater protection for merchant ships. Greatly reduced protection and income for pirates, undercutting their profits and business model. Criminal threats against the crew are possible at sea or ashore - international forces are able to act against pirates with much greater impact while at sea.

[history](#)

ADD COMMENT

Comments:

[Add Comment](#)

[View all](#)



[EdwardPreble](#) Mon, 2 Jul 2012 13:48:56 PDT

[hide](#)

Executing hostages and sinking ransomed ships can also occur while the ship is held at a pirate camp ashore. So it is always a pirate option. The difference in the situation is that pirate captors have no shore infrastructure at sea, no help from other pirates, no communications with the crime bosses, and no other exit (for themselves personally) besides capture by naval forces.



[Finius Stormfroh](#) Sun, 1 Jul 2012 19:51:31 PDT

[hide](#)

Boarding ships full of hostages at sea is a risky business. Does the quarantine continue if the pirates execute hostages or rig ships to sink to deter rescue attempts?



[EdwardPreble](#) Sat, 30 Jun 2012 08:32:02 PDT

[hide](#)

Smaller ships might also seek protection by registering prior intent to NEVER cross the quarantine barrier. This allows naval forces to have a clear indication of a smaller ship's intent if it appears to be heading towards a pirate sanctuary.

Authors can chat to collaborate

THE PLAN

Talk it over

IMAGES

VIDEO

MAP

Authors, this is your team space.

Game.defaultActionPlanTalkText:
Coming up with an action plan – with people you may not know across multiple time zones – can be a challenge. But you can use this private* chat room to trade ideas in real time or leave messages for your teammates.

You might want to start by discussing the basic ideas in your card chain. How are you going to make those ideas work? What's the core idea? And what are the actions you need to take?

Talk it over here. But don't be shy about just starting to fill in the plan. Switch back and forth between The Plan and this team discussion space as you build your winning action plan.

**Your chats cannot be seen by anyone else in the game other than gamemasters. However, they will be available to analysts for post-game analysis.*

Type here to chat, RETURN submits

submit

LawDawg 08/02 11:56 PDT	I'm working on information sharing and coordination efforts which could tie nicely into this. I would also look into the where Lloyds of London specifically defines their War Risk Zone for that area. Could hold some implications for placement of naval vessels.
LawDawg 08/02 09:33 PDT	This could all be enforced through insurance rates as well...something to consider.
LawDawg 08/02 09:32 PDT	I think the Socotra Islands would make an potential "check point" in the quarantine. Obviously shippers don't want to navigate around it (greater fuel costs, etc.) but with proper tracking and reporting it would be known when ships travel through this particular area. This could result in increased vigilance on the part of naval ships enforcing the quarantine. As for those who don't report or check in, enter at your own risk.
WillyRobert 07/29 11:47 PDT	I'll hopefully have a pic up within the next day or so to give example of what I'm thinking.
WillyRobert 07/29 11:46 PDT	As I'm working on a model for this, we need to consider how we handle patrols around Socotra Islands. It is within the 200NM zone, but thinking we need to add units between it and Somalia which stops easy access to this key location. I am thinking at least 2 units need to be placed on the inside of the 200NM zone and between the island and Somali mainland. Thoughts??
WillyRobert 07/24 13:35 PDT	Very interesting and something that we can without a doubt simulate! Thanks.
LawDawg 07/23 16:16 PDT	http://www.esa.int/esaEO/SEMATD8X73H_index_0.html This article explores how environmental conditions limit pirate activity. Conclusions show that wave hight and pirate attacks were correlated as well as wind speed and pirate activity. (Once wind speeds exceeded 9 m/s, no successful attacks occurred. Nearly all piracy was in seas with wave height less than 2.5 m, and most attacks were conducted in calm oceans with waves less than 1 m in height. No successful attacks occurred on days where wave height exceeded 2.5 m.) Weather patterns (and proper weather balloon placement) could help determine the correct boundaries for the naval quarantine.

Authors can request expertise from other players who can help



Request for Expertise [X]

Option 1: Search for players with needed expertise

Option 2: Post help-wanted notice to action plan

Current posting

What other naval quarantines have occurred other than in wartime?

Clear Post

Option 3: Post Trouble Report

Close

Authors, add some images!

Game.defaultActionPlanImagesText:
Photographs, pictures, and charts bring your action plan to life and convey important details that might not fit easily into the text of your plan.

You can search online for images, or upload images from your own desktop. Be sure to add a caption that explains the significance of each image.

Hint: You may want to give one of your team members the responsibility for tracking down the images that support your plan.

ADD YOUR IMAGE

Proposed Naval Quarantine of Southern Somali Coastlin



Naval forces can significantly reduce patrol and response requirements by establishing a naval quarantine on large merchant vessels along the southern Somalia coastline. Unless it has filed prior

NavalQuarantineSouthernSomalia.reduced.png

[delete](#)

Horn of Africa, Socotra Island, Garaad, Eyl Somalia



Horn of Africa closeup shoing one northern camp at Garaad Somalia, Socotra Island (Yemen) and eastern camp at Eyl Somalia.

SocotralslandGaraadEylSomalia.png

[delete](#)

Pirate camps identified in public press



"GIS & Satellite: Applications for Piracy-Monitoring" by Josh Lyons, Freedom From Fear magazine, 17 July 2012.

SomaliaPirateCamps.png

[delete](#)

Shoreline Eyl Somalia: Dinghies, Merchant Ship



More information on Eyl Somalia can be found on Wikipedia at <http://en.wikipedia.org/wiki/Eyl>

Note the large merchant ship that is close ashore,

ShorelineEylSomaliaDinghiesMerchantShip.png

[delete](#)

Authors can add images, videos and annotated maps to Action Plans

THE PLAN TALK IT OVER IMAGES Video MAP

Authors, add some videos!


A video is worth a thousand words. Consider:

1. Making a 1-2 minute video to tell us about your action plan.
2. Share a video you've found that helps support your action plan.

Add a caption to highlight the point you're making.

ADD YOUR VIDEO


Somalia Piracy



Somalia Piracy - created at <http://animoto.com>

Youtube ID: BQoXBaawblq delete

NAVY SEALS RESCUE CAPTAIN RICHARD PHILLIPS



U.S. Navy Seals Snipers
U.S.S. Bainbridge

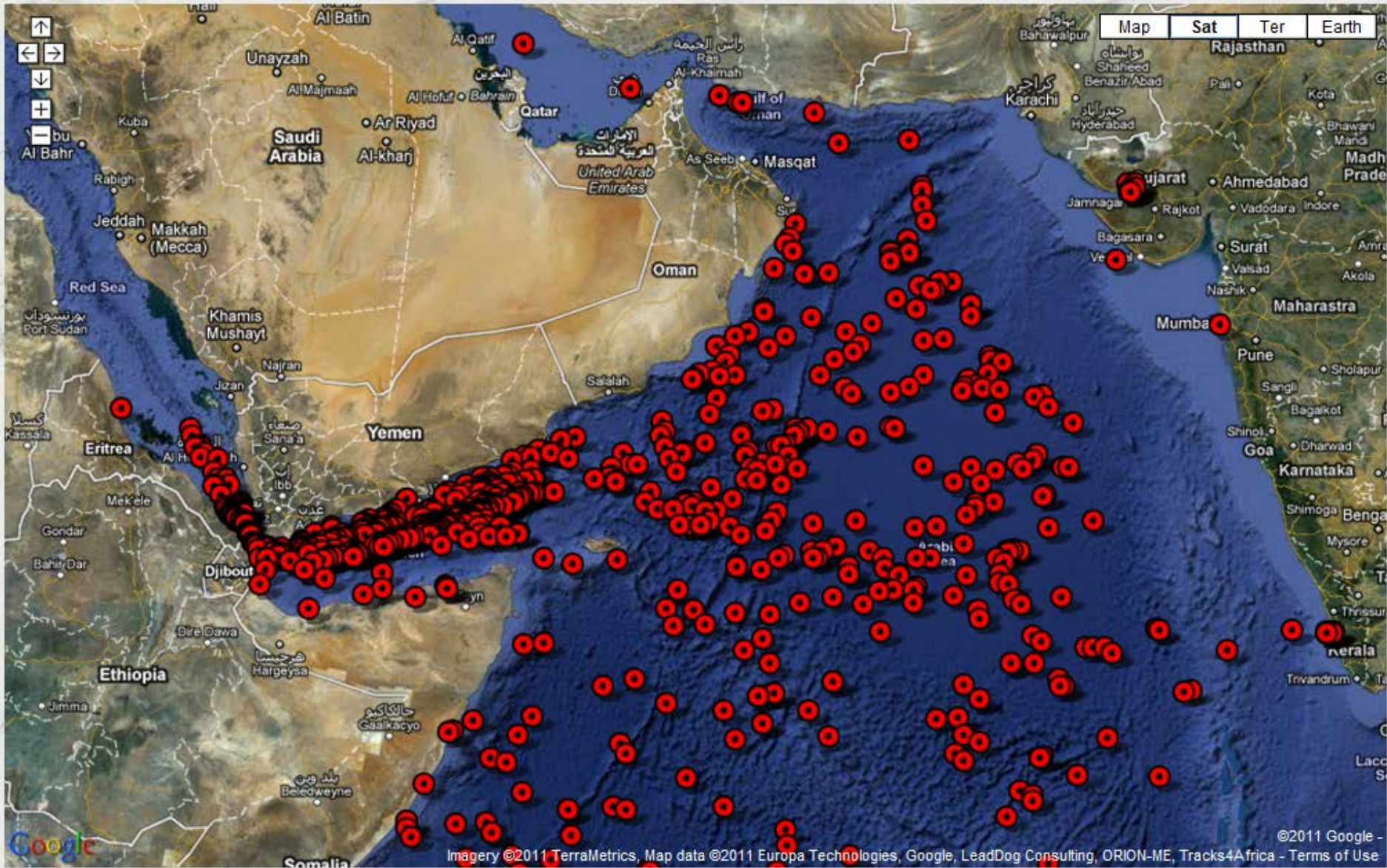
Somali pirates hijack MV Maersk Alabama, U.S. Navy Seals conduct rescue.

Youtube ID: IVSCZEjoBKw delete



Mmowgli Map

725



**But how does a player
know what to say?**



Hey everybody, be yourself

Say what you think, tell what you know!

- “Wisdom of the crowd” can often help show which ideas have best merit (biggest impact)

Conversation across traditional organizational divisions or “union lines” can be surprising

- Unexpected combinations of ideas can lead to innovative new concepts and investments

ONR interested in technical solutions that help improve Navy effectiveness against piracy

User portal provides further info

We have set up a “piracy portal” to provide additional social networking capabilities

- LifeRay open source server, Web based, Java
- Public visibility, separate set of user accounts

Informed conversation is especially important when discussing hard problems without easy solutions



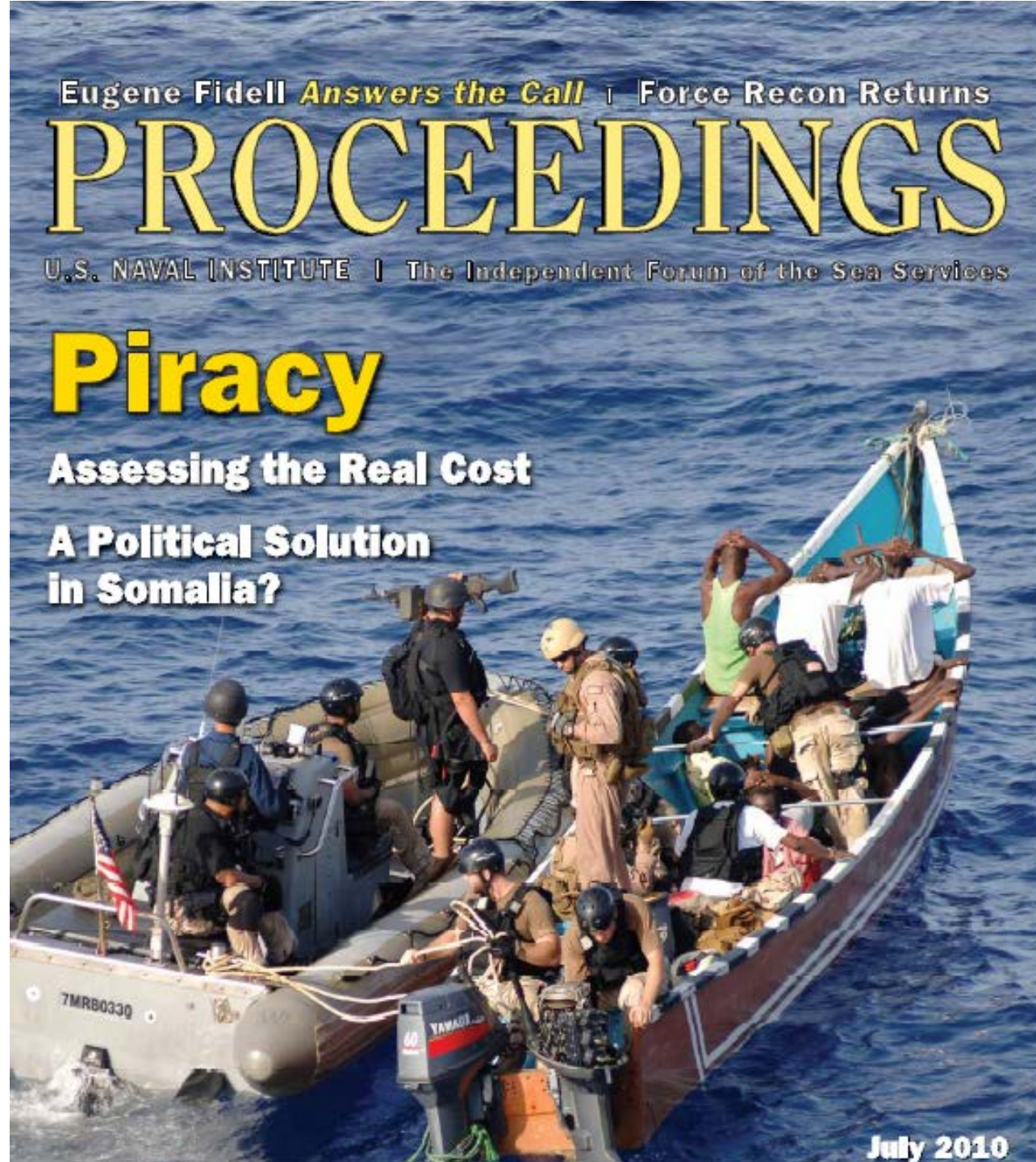
How Pirates Treat Crews, ReCAAP, 2003-2007

	2007	2006	2005	2004	2003
KILLED/ MISSING	1	2	1	8	2
CREW ABANDONED	1	0	2	1	5
SERIOUSLY INJURED	1	4	4	8	10
KIDNAPPED/ HIJACKED	4	1	4	14	2
ASSAULTED/ HOSTAGE	8	24	16	27	30
THREATENED	3	5	6	11	10
NO INJURY OR NOT REPORTED	59	64	84	76	94
TOTAL NUMBER OF ACTUAL INCIDENTS	77	100	117	145	153

Source: RECAAP Information Sharing Center, Annual Report, 2007. P. 23
<http://www.middlebury.edu/SouthChinaSea>

Lots of
resources
to collect..

Portal
approach
can enable
community
efforts



Why is MMOWGLI a game?

Because players can get points and win

- Analytic, resembles a *collaborative war game*

Note that scoring is indirect

- Players only get points for responses by other players, not their own
- Thought leaders and good ideas will emerge

Thus, biggest game value is group collaboration and “crowd-sourcing” intelligent responses

What is a wargame?

War game (*plural war games*)

- (Military) A simulation, by whatever means, of a military operation involving two or more opposing forces using rules, data, and procedures designed to depict an actual or assumed real-life situation.
- A game that simulates or represents a military operation.

What are common products from group-play wargames?

Here is a characterization of wargames at NPS. Your percentages may vary...

- 80% of time we get common knowledge
 - OK since it shows people are paying attention
- 15% of time we get unusual, unusable ideas
 - OK since it shows people thinking outside the box
- 1% to 3% of time we get “golden nuggets”
 - New ideas from unplanned crosstalk banging on a problem that might never have occurred otherwise



massively multiplayer online war game leveraging the internet

Game Statistics 2011

	Piracy 2011.1 (Move 1-2-3)	Piracy 2011.2 (Move N-Alfa)	Piracy 2011.3 (Move N-Bravo)	Total
Dates	31-May-3 June, 21-23 June, 5-8 July	7-9 November	10-13 November	-
Days duration	11	3	3.5	18
Signups	16,000	31,000	31,000	31,000
Invitees	2,200	7,500	7,500	15,000
Players	832	920	413	~2,100
Signup %	30.7%	12.3%	5.5%	14%
# Idea Cards	5142	5608	4228	14,978
# Action Plans	28	18	22	68
# Game Master Accounts	29	50	46	~60



massively multiplayer online war game leveraging the internet

Game Statistics 2012

	energyMMOWGLI	piracyMMOWGLI 2012
Dates	21-27 May 2012	18 June - present, ongoing
Days duration	5	40
Signups	-	-
Invitees	797	Several hundred
Players	561	115
Signup %	70.4%	Slow increase
# Idea Cards	5121	432
# Action Plans	37	8
# Game Master Accounts	47	10

So what does it mean for you, today?

How can the counter-piracy community
best take advantage of this shared resource?



Implications for Anti-Piracy Efforts

No longer waiting for ideas to be “put on the agenda”

Few barriers or limitations

“Bank” of ideas ready for further consideration

Holistic, creative solutions can be explored in depth

The dashboard displays a grid of strategy cards. The top card, titled "BEST STRATEGY", contains the text: "Next generation combat ships are far too expensive. Invest in mission specific designs without stealth etc and smallest crews possible." It is marked as "Super-interesting" and dated 11/07 07:13 PST. Below this are four columns of action cards: EXPAND, COUNTER, ADAPT, and EXPLORE. Each card provides a specific action and a brief description. For example, the "EXPAND" card suggests building on the idea to amplify its impact, while the "COUNTER" card challenges the idea. A search bar at the bottom right shows a search for "pirate" with a list of related terms and a table of search results.

BEST STRATEGY 201 ★

Next generation combat ships are far too expensive. Invest in mission specific designs without stealth etc and smallest crews possible.

A game master has marked this card Super-interesting

mbuehner 11/07 07:13 PST

Handwritten notes: "go to idea Dashboard" and "View card chain"

EXPAND	COUNTER	ADAPT	EXPLORE
Build on this idea to amplify its impact	Challenge this idea	Take this idea in a different direction	Something missing? Ask a question
848 ★	853 ★	249 ★	432 ★
Maybe similar to what others are saying you think of this as a series of lego pieces, put together a force rather than buying pre-configured monkeys 11/07 11:22 PST	Individually ships might be less expensive, but the overall cost could grow much larger if you have to make more mission specific ships. 9601 11/07 11:25 PST	High-end, mission specific craft that would class at their specific tasks for war, and flexible, low cost craft for LIC, stability ops, etc. jogueadventurer 11/07 07:19 PST	While each ship would be less expensive, there are a lot of Navy missions. Could you make them capability specific rather than monkeys 11/07 08:31 PST
442 ★	271 ★	236 ★	411 ★
A bit expensive and impractical for the US Navy to do so alone. As a joint effort within a coalition holds greater possibility. sath 11/07 08:36 PST	The model for your idea is aircraft. Smallest crew possible and highly specialized mission specific designs. It is not cheap. 115tech 11/07 07:27 PST	True of the status quo. But it is possible to build much more effective and appropriate assets for a fraction of the cost. vstar 11/07 07:16 PST	Don't forget the navy may need to board a civilian ship. Why not also help innovate civilian ship design to include this possibility. dhoms2200 11/07 08:25 PST
399 ★			
Develop a littoral mothership with smaller modular LCS capable satellite vessels to patrol for extended periods autonomously. knivledge 11/07 08:20 PST			
279 ★			
A mobile anti-piracy fleet operating in the littorals doesn't need to be state of the art. Here presence is more important than stealth etc. citizenships 11/07 07:29 PST			
246 ★			
Possibly designing a "Swiss army knife ship" that would allow devices to be added and removed from ships as needed would be more effective. mccccccccc 11/07 07:18 PST			

Search for Cards, Action Plans, Users

Word root cloud

arctic area base better build capabl commun cost creat data develop econom effect expens forc fund global govern idea littor local look mission nation naval navy network oper patrol peopl pirate possibl problem region requir ship situat state support technolog threat uav us usn vessel water world

Found 77

ITEM	CONTENT
Best Strategy 527	Back existing private sector efforts for a unified UN anti-piracy force. The private se...
Counter 538	The main reason for piracy is that it provides more income than legitimate jobs. Why...
Expand 34	Use large network of low cost, persistent UAVs to cover a wide area. Monitor natur...
Player 1083	nkklva , USAF Wargamer / US Navy anti-piracy, U.S. Air Force
Player 1012	kaualme, Washington, DC, Senior member of NRE and knowledgeable about Sor
Player 1269	hitch657, Washington DC, tracking piracy for effects on military cargo shipments, L
Player 1390	slothmaster, Phnom Penh, Years spent plotting first episode of space piracy , Acac
Player 1556	muschka, Prague, Czech Republic, AI student of game theory and maritime piracy
Player 1016	ajhp, London, UK, Have written a Masters Thesis on Counter Piracy operations an
Action Plan 9	Expanding regional partnership initiatives and capacity building in Africa to combat
Action Plan 1	Action plans can help solve piracy problems: this plan provides example guidance
Action Plan 4	What laws and treaties need revised/updated for 21st century changes in politics, t
Action Plan 11	Scenario: pirates begin to influence local gov'ts as wealth & power increase

Oceans Beyond Piracy (OBP)

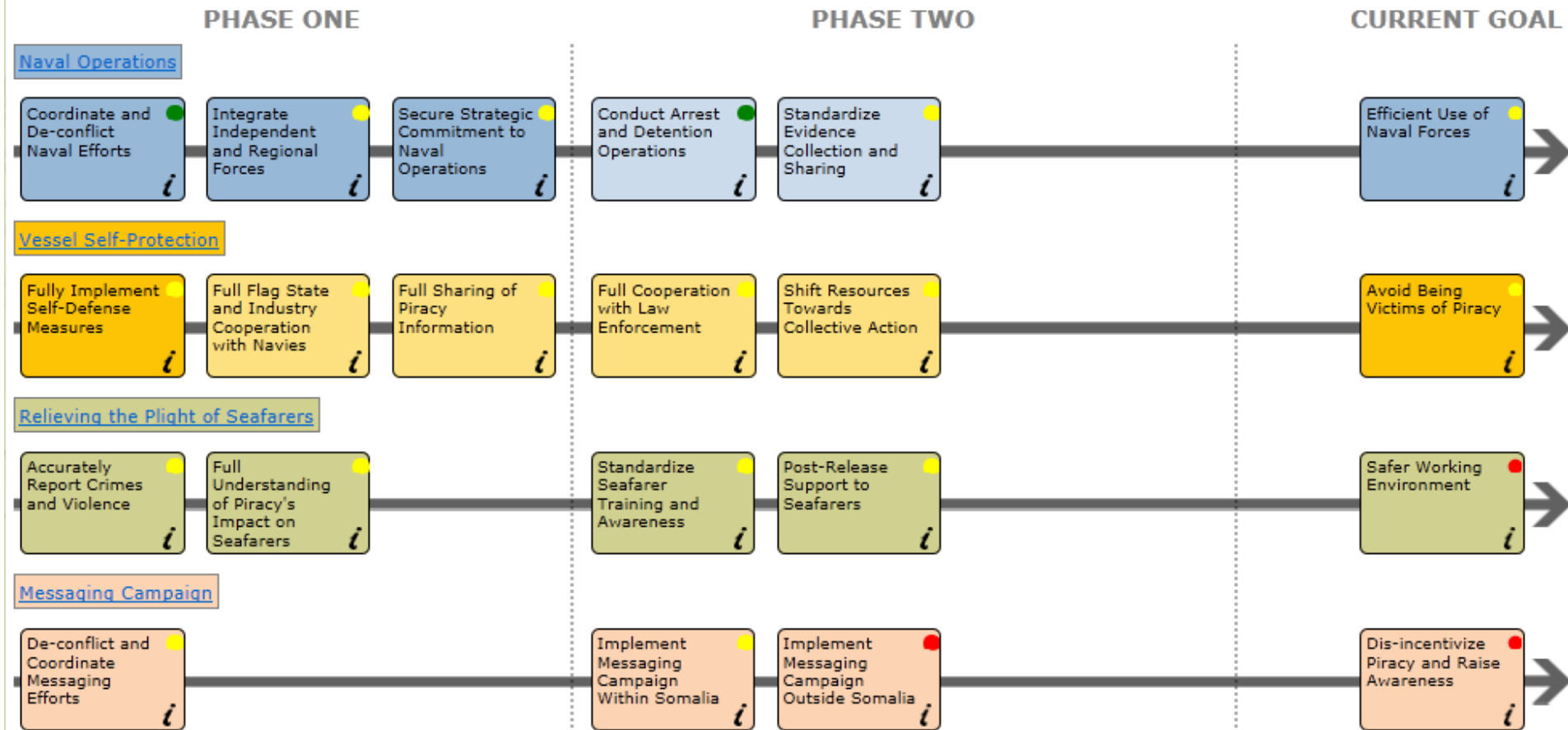


Oceans Beyond Piracy is our partner in the current Piracy MMOWGLI 2102 Game

- <http://oceansbeyondpiracy.org>

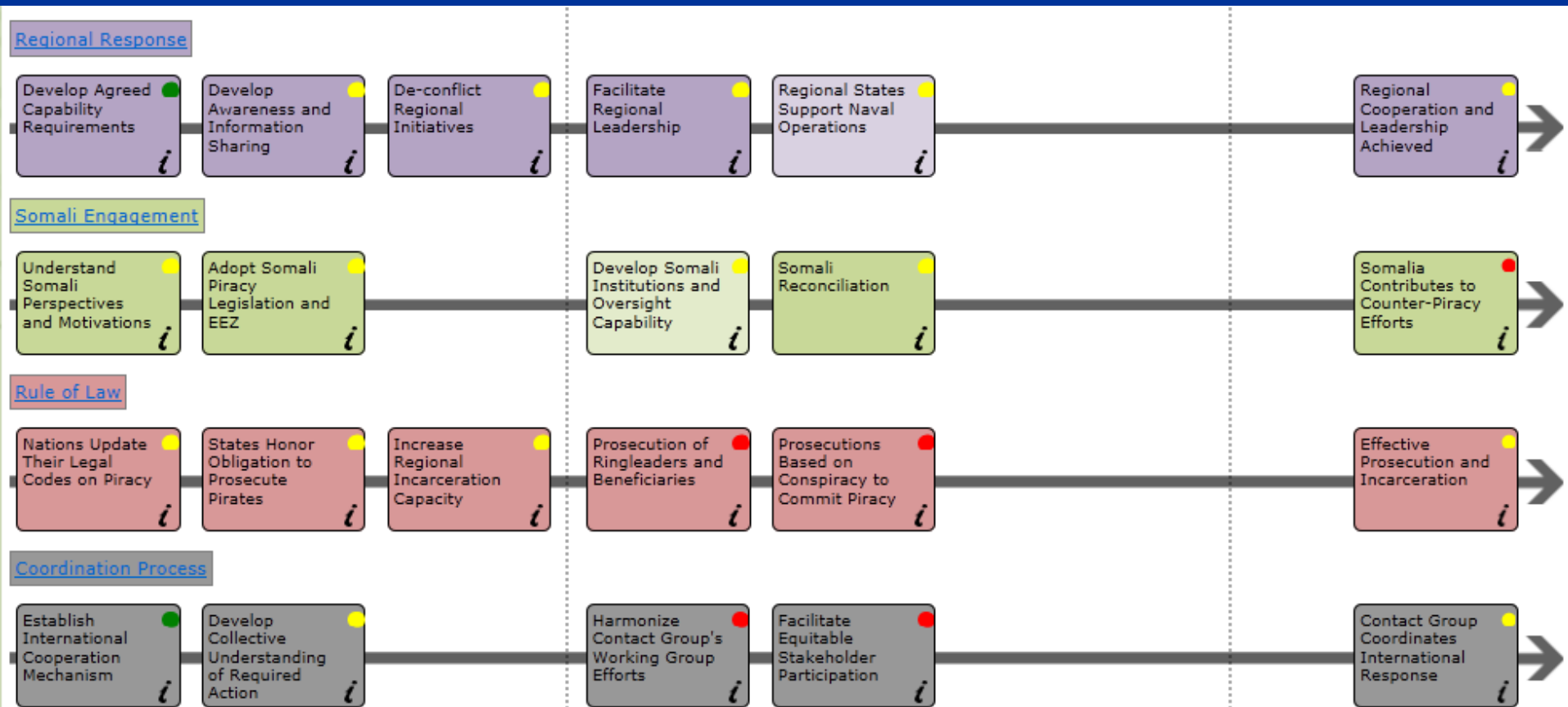
We're examining eight Line of Efforts from the recent OBP [Independent Assessment Report](#)

OBP Lines of Effort, 1 thru 4



http://oceansbeyondpiracy.org/independent_assessment

OBP Lines of Effort, 5 thru 8



Independent Assessment Report abstract

This independent assessment was conducted to describe and evaluate the extensive international and regional efforts to address piracy in the Gulf of Aden and the Indian Ocean. The study was conducted in an atmosphere of increased visibility and awareness of the economic and human cost of piracy, as well as growing concern amongst stakeholders over the utility and direction of regional and international counter-piracy efforts.

To date, these efforts have largely focused on mitigating the symptoms of piracy, which has been successful in limited areas, but there are multiple costs associated with ongoing efforts. It would be advantageous for planning efforts - which currently focus on mitigation and containment - to shift planning efforts towards deterrence and suppression. Similarly, the study recommends that resources shift from individual protection towards investment in collective solutions.

The More Complex the Environment...



The greater the potential security risk!

“We may be dealing with a 17th Century crime, but we need to bring 21st Century solutions to bear.”

- US Secretary of State Hillary Clinton, 2009



We're hoping MMOWGLI helps counter-piracy dialog

Proposed next steps: play the game

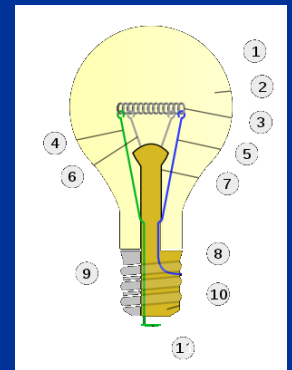
This group is invited to a dedicated MMOWGLI game.

Consider past game results

- 15,000 idea cards
- 68 action plans

Consider new ideas together


- Known identification of players
- No sensitive information posted



Goal is to continue dialogue from this conference.
How can communities best combat piracy together?

Slow but steady game growth since June 2012...

piracyMMOWGLI 2012 game is underway

 6/18/12 7:30 AM


After lots of preparation, the **new piracyMMOWGLI 2012 game is up and running!** We're excited about this progress since this is the first long-duration game in the *Massive Multiplayer Online War Game Leveraging the Internet (MMOWGLI)* series. We will publicly publish results several times each week.

The *piracyMMOWGLI 2012* game is for maritime professionals exploring how to best counter the scourge of international maritime piracy. Together we're proposing new [Idea Card Chains](#) and [Action Plans](#) to work together more effectively.

Piracy is a complex problem with many stakeholders involved from many fields of work. Each week we examine a new Line of Effort from the [Independent Assessment Report](#) by Oceans Beyond Piracy. Your contributions matter! Please join us for 30 minutes each week to consider the possibilities.

Naval Operations is this week's topic. You can check the [Piracy Blog](#) for game news and the [Piracy MMOWGLI Games](#) page for prior games. The [Game Wiki](#) has even more information about piracy.

Thanks for all contributions. Play the game, change the game!

 By Don Brutzman



What would it take for this group to participate?



Play the game, change the game!

<https://mmowgli.nps.edu/portal>

You are invited to play !



scale & diversity of players

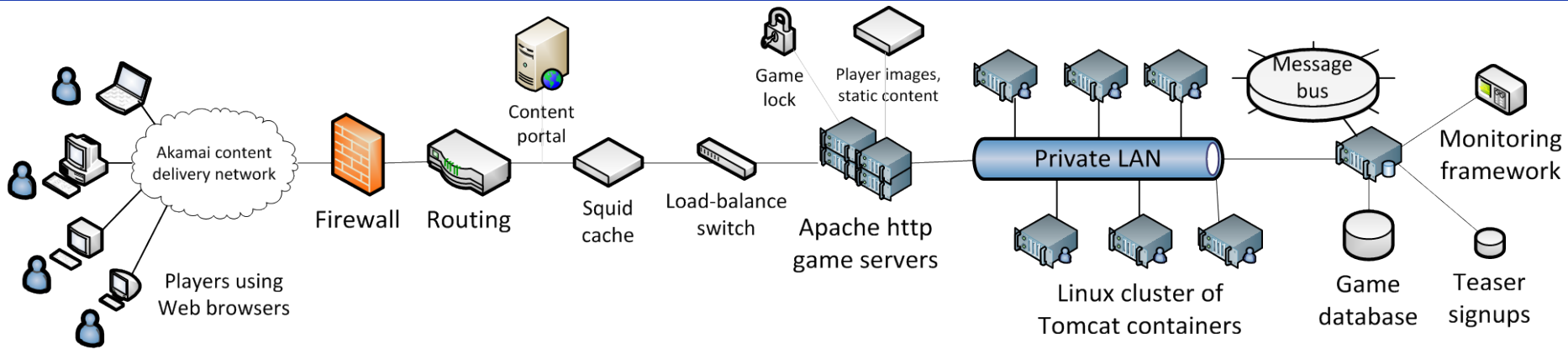


How did NPS build the game?

Lots of open source software

Lots of testing and learning through practice

Infrastructure



3-tier architecture: client, server, database

Runs through web browser

Scalable, repeatable, open source codebases

Software development

Java programming for robustness

- VAADIN graphical user interface (GUI) toolkit
- Google Web Toolkit (GWT) for cross-browser use

BUT output is html, javascript, .war archives

- So results are high quality and consistent across all flavors of Web browsers
- Internet Explorer, Firefox, Chrome, Safari, Opera

Numerous open-source tools used

- Building, loading, monitoring, testing, reporting



Deployment lessons learned

Akamai Content Delivery Network (CDN)

- Necessary for Navy Marine Corps Internet (NMCI)
- Otherwise merely helpful for us
- Contracted service, <http://www.akamai.net>

Load testing essential

- Spiral process, heavy lifting, time consuming
- Inside (Jmeter), outside (Selenium, BrowserMob)
- MySql database highly configurable, performant

Optimization lessons learned

Logging within a cluster is challenging

- Ganglia for Apache and cluster monitoring
- JMelody for tomcat container statistics

Users frequently provide “surprises”

- Practice games helpful
- Looking to support 24 x 7 x whatever

Multiplayer design options

- Messaging, database locking, object caching
- Dial-able interaction via server “push” to user



Akamai Content Delivery Services,
<http://www.akamai.com> (contract by
ONR)

Apache secure http server, <http://apache.org>

Apache ActiveMQ message queue for intra-
cluster synchronization,
<http://activemq.apache.org>

Apache Tomcat servlet containers,
<http://tomcat.apache.org>

AWStats free real-time logfile analyzer to get
advanced statistics
<http://awstats.sourceforge.net>

BrowserMob cloud-based load tests for
multiple browsers,
<https://browsermob.com> (contract)

Client Web browsers supported: Chrome,
Firefox, Internet Explorer, Opera, Safari

Eclipse Integrated Development Environment
(IDE), <http://eclipse.org>

Google Web Fonts,
<http://www.google.com/webfonts>

Google Web Toolkit (GWT),
<http://code.google.com/webtoolkit>

Hibernate Java-based relational database
persistence API, <http://www.hibernate.org>

Java programming language,
<http://java.oracle.com>

JMeter load testing and performance
measuring, <http://jmeter.apache.org>

LifeRay Community Portal,
<http://www.liferay.com>

Linux operating system by CentOS,
<http://www.centos.org>

Mailman GNU archived list server,
<http://www.list.org>

MySQL database, <http://www.mysql.com>

Netbeans Integrated Development
Environment (IDE), <http://netbeans.org>

Selenium unit testing for Web browser clients
<http://seleniumhq.org>

Subversion for version control,
<http://subversion.apache.org>

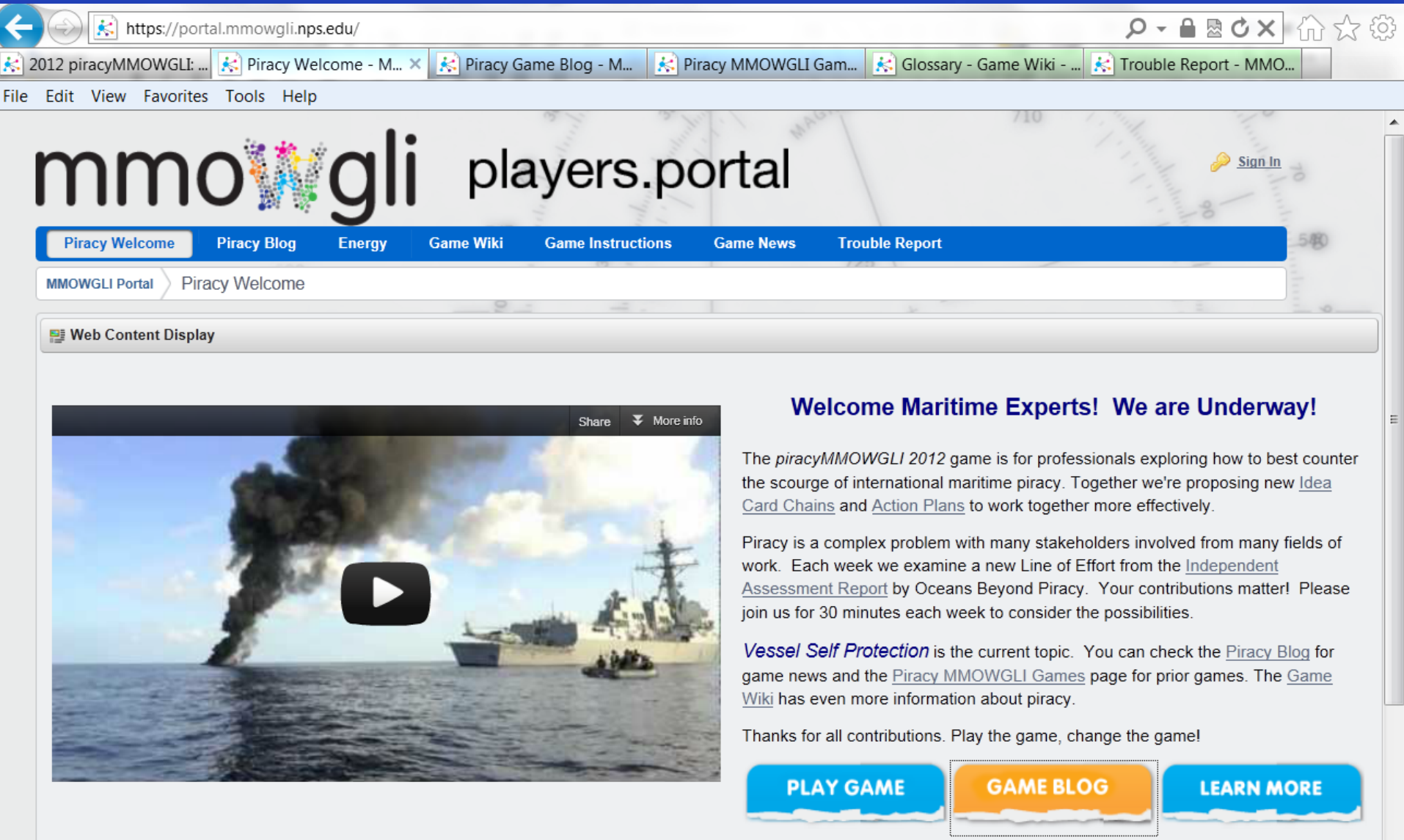
Squid caching proxy for Web server
optimization, <http://www.squid-cache.org>

Vaadin GUI framework, <https://vaadin.com>

Vaadin Testbench, [https://vaadin.com/add-
ons/testbench](https://vaadin.com/add-ons/testbench) (license)

Public portal page, piracy 2012

<https://portal.mmowgli.nps.edu/piracy-welcome>



2012 piracyMMOWGLI: ... Piracy Welcome - M... Piracy Game Blog - M... Piracy MMOWGLI Gam... Glossary - Game Wiki - ... Trouble Report - MMO...

File Edit View Favorites Tools Help

mmowgli players.portal


Sign In

Piracy Welcome Piracy Blog Energy Game Wiki Game Instructions Game News Trouble Report

MMOWGLI Portal Piracy Welcome

Web Content Display

Share More info



Welcome Maritime Experts! We are Underway!

The *piracyMMOWGLI 2012* game is for professionals exploring how to best counter the scourge of international maritime piracy. Together we're proposing new [Idea Card Chains](#) and [Action Plans](#) to work together more effectively.

Piracy is a complex problem with many stakeholders involved from many fields of work. Each week we examine a new Line of Effort from the [Independent Assessment Report](#) by Oceans Beyond Piracy. Your contributions matter! Please join us for 30 minutes each week to consider the possibilities.

Vessel Self Protection is the current topic. You can check the [Piracy Blog](#) for game news and the [Piracy MMOWGLI Games](#) page for prior games. The [Game Wiki](#) has even more information about piracy.

Thanks for all contributions. Play the game, change the game!

PLAY GAME GAME BLOG LEARN MORE

[Piracy Welcome](#)[Piracy Blog](#)[Energy](#)[Game Wiki](#)[Game Instructions](#)[Game News](#)[Trouble Report](#)[MMOWGLI Portal](#)[Game Wiki](#)[FrontPage](#) | [Recent Changes](#) | [All Pages](#) | [Orphan Pages](#) | [Draft Pages](#)

FrontPage

Game Resources

- [About MMOWGLI](#)
- [Credits and Contact](#)
- [Fixes and Frequently Asked Questions \(FAQs\)](#)
- [Game Blog](#) announcements
- [Game Instructions](#) (play and win!)
- [Game News](#)
- [Glossary of acronyms](#)
- [Lexical Link Analysis \(LLA\)](#)
- [Press Coverage](#)
- [Terms and Conditions](#)
- [Twitter #mmowgli](#)
- [Video Resources](#)

Piracy Resources

- [Piracy MMOWGLI Games](#)
- [Articles](#) and news about piracy
- [Bookshelf](#) of longer works
- [Games](#) about piracy
- [Homeland Security Digital Library \(HSDL\)](#) includes [Maritime Domain](#) and [Sea Piracy](#) collections
- [Incidents](#) of relevant interest
- [Information Sources](#) on piracy
- [Maps](#) illustrating piracy activity
- [Masters theses](#)
- [Published papers](#) on piracy

Energy Resources

- [Game-launch press release](#)
- [Game registration](#)
- [energyMMOWGLI announcement](#)
- [Game Energy Blog](#)
- [Navy Energy Security Strategy](#)
- [U.S. Navy Energy, Environment and Climate Change](#)
- [N45, ONR Innovation energyMMOWGLI Interview](#)
- [Energy References](#)
- What other information will we offer to Energy MMOWGLI players?

Public portal page, energy game

<https://portal.mmowgli.nps.edu/energy-welcome>

We're done! Congratulations and thanks *energyMMOWGLI* players for many tremendous efforts.
Player contributions include over [5000 Idea Cards](#) and [37 Action Plans](#) for ongoing consideration. The [Energy Blog](#) tells the game story.



Share More info

ERICA JOHNSON
MILITARY CORRESPONDENT
WASHINGTON D.C.

BREAKING NEWS MAY 22ND, 2022

BREAKING: WEAK OIL SITUATION THREATENS NAVAL OPERATIONS

(No video? Try [this](#))

NAVY + CITIZENS + WINNING IDEAS = new energy solutions

The week of May 21, the U.S. Navy will launch energy MMOWGLI, a massively multiplayer online game for securing the Navy's energy future.

Play the game, change the game.
Week of 21 May 2012

PLAY GAME

LEARN MORE

Public affairs media kit, energy game

<https://mmowgli.nps.edu/mediakit>

mmowgli players.portal

 [Sign In](#)

[Piracy Welcome](#)

[Piracy Blog](#)

[Energy](#)

[Game Wiki](#)

[Game Instructions](#)

[Game News](#)

[Trouble Report](#)

[MMOWGLI Portal](#)

[Energy](#)

[Energy MediaKit](#)

NAVY + CITIZENS + WINNING IDEAS
= new energy solutions



Play the game
change the game

Week of May 21, 2012

We all know the hard facts. Over the next decade, a barrel of oil will cost even more than it does today. It will come from increasingly unstable sources. And there will be less of it to go around. Unless we act, the operational readiness of today's Navy could turn into operational vulnerability for tomorrow's Navy. We need YOUR IDEAS. Everything you know about energy—from your strategies at home to your workplace conversations, from your professional knowledge to your wisest imaginations—could add up to the energy equation that will help keep our Navy the strongest in the world.

The week of May 21, the U.S. Navy will launch energyMMOWGLI, a massively multiplayer online game for securing the Navy's energy future.



energy mmo gli



portal.mmowgli.nps.edu

Media Kit for the energyMMOWGLI Game

This page provides publicly released information for press interest about energyMMOWGLI.

Resources

- [Welcome page](#) provides game dates, the Call To Action video, and links for game results
- [Game-launch press release](#)
- [energyMMOWGLI Flyer](#) (shown at left)
- [Energy Blog](#) provides activity updates throughout the game
- [Question and Answer \(Q&A\) interview](#) with energyMMOWGLI Team: Cdr Jim Goudreau, OPNAV N45 Task Force Energy, and Dr. Larry Schuette, ONR Director of Innovation
- [Massive Online Wargame Launched for Members of NPS Community](#) by MC1 Grant P. Ammon, published within [NPS Intranet](#), 15 May 2012.
- [Game News](#) from official U.S. Navy sources
- [Press Coverage](#) about MMOWGLI from external sources
- [Google Alerts](#) for a listing of recent MMOWGLI news
- [Video Resources](#) includes Call To Action vignettes produced for the MMOWGLI games

Biographies for energyMMOWGLI Team

- [CDR Jim Goudreau USN](#), OPNAV N45 Task Force Energy, Director Navy Energy Coordination Office, Game Sponsor
- [Dr. Larry Schuette](#), ONR Director of Innovation, Program Sponsor
- Garth Jensen, Naval Surface Warfare Center Carderock Division (NSWCCD) Innovation Chair, MMOWGLI Program Manager
- [Jason Tester](#) (bio), Research Director, Human Future Interaction, Institute for the Future (ITF)
- [Dr. Don Brutzman](#), Principal Investigator, Naval Postgraduate School (NPS)

Idea card publication, html/XML

Efficiency Card Chains: New or Best Strategies

mmowgli
massively multiplayer online war game browser for internet

1	* SeedCard: Seed cards can establish initial game themes to get the conversation started in productive directions
2	SeedCard: Card links are created simply by entering text. For example, see card 1 .
3	SeedCard: Action plan links can be created by simple text entries. For example see action plan 1 .
4	SeedCard: The Navy Energy Security Policy http://www.navy.mil/features/Navy_EnergySecurity.pdf provides excellent top-level themes for exploring energy st
5	SeedCard: Strategy 1, Energy Efficient Acquisition: Evaluation of energy factors will be mandatory when awarding contracts for systems and buildings.
1179	<i>wryan34:</i> Consider both energy consumption and efficiency as requirements not just factors.
516	<i>mfidelman:</i> Include specific consideration of transportation energy use in evaluating buildings/sites/systems (e.g. electric vehicle charging stations).
514	<i>mfidelman:</i> Include specific consideration of whether a project includes sustainable energy systems (e.g., solar panels on roof, wind turbines on site).
642	<i>kiperto:</i> Sustainable makes for a great buzzword, but the consideration should focus on technology that improved system efficiency over baseline.
679	<i>Yirrk:</i> I think a whole new system is needed. The current one is way too inefficient. Oil is a massive monkey on the back.
11	gm_chad: Strategy 2, Sail the "Great Green Fleet": DON will demonstrate a Green Strike Group in local operations by 2012 and sail it by 2016.
1969	<i>wryan34:</i> Even the best biofuels are less energy dense than petroleum and need to be mixed. Need longer hydrocarbon biofuels to be true "drop in".
2439	<i>Cliff:</i> Ethanol has only 2/3 the energy per gallon of gasoline. The best batteries and fuel cells are more than an order of magnitude lower.
1489	<i>Cliff:</i> Navy energy strategy requires 3M bbl of drop-in liquid biofuel by 2016 and 8M bbl a year by 2020-will bankrupt DoD.
1477	<i>Cliff:</i> Paying \$26.75 a gallon for biofuel makes us fools to our adversaries. We should hope they waste their money on liquid biofuels.
70	<i>gm_balaji:</i> Can you please provide reference and supporting URL for this?
2435	<i>Cliff:</i> For example, Navy just spent \$245K to Albemarle for 55 gal of jet fuel made from biobutanol = \$4,455 a gallon or \$187,000 a barrel.
2429	<i>Cliff:</i> Website FPDS.gov has data on all federal government spending and is a great resource to research biofuels spending.
2426	<i>Cliff:</i> Quantities are from the Navy Energy Strategy and statements of the Secretary of the Navy and his Assistant Secretary of Energy.
13	gm_donb: Strategy 3, Reduce Non-Tactical Petroleum Use: By 2015, DON will reduce petroleum use in the commercial fleet by 50%.
256	<i>Hoktieman78:</i> A very simple proposition: reduce the size and usage of the fleet. Have less ships, and use them less.
14	gm_donb: Strategy 4, Increase Alternative Energy Ashore
3068	<i>Sass:</i> Supercritical water in deep, drillhole reactors can turn chipped biomass into either syngas-based biofuels or biochar for fuel cells.
2938	<i>Green Hawk:</i> District-scale GEO-THERMAL could meet energy needs of every military base.
3554	* <i>gm_aerik:</i> Yes, geothermal energy can be extracted only 5 feet below the ground in some cases.
23	<i>gm_becca:</i> On shore domestically or internationally exploration?
22	<i>JayAre:</i> What are the lessons learned from installing solar panels in shore bases? Aren't there lessons learned?
21	<i>JayAre:</i> Do we really have much control of energy costs ashore if the power industry sets prices?
3473	<i>wryan34:</i> Yes, many Navy/MC bases negotiate power rates and purchase as a commodity. Changing the usage profile provides better negotiating power.
2937	<i>Green Hawk:</i> generate as much power on base as possible.
2935	<i>Green Hawk:</i> Self-sufficiency means not depending on power industry;
709	<i>rsf1961:</i> need to take large military and gvt installations off the grid.
170	* <i>NavyMIT:</i> Civilian communities construct small wind turbines, solar collectors, etc. and sell power back to industry. The market is flexible.

Action plan publication, html/XML

Action Plan 31

mmowgli

massively multiplayer online war game browser to internet

ID
[Action Plan 31](#) for energyMMOWGLI 2012

Description
Add "reducing energy consumption" to Battle 'E' criteria.

Rating
1.1 "thumbs up" average score from 0 to 3

Idea Card Chain
[Idea Card Chain 2385](#) started by player *Seahawk91*: Add "reducing energy consumption" to the criteria for Battle 'E' awards.

Who Is Involved
Entire Navy

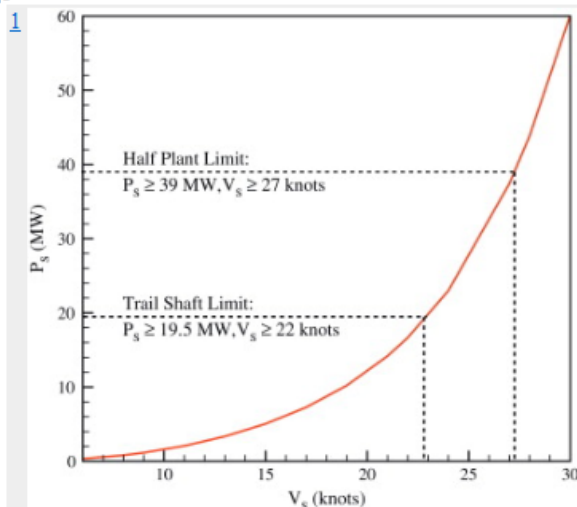
What Is It
A program that awards battle E if a ship meets energy consumption standards

What Will It Take
Standardized metrics that be utilized by different unit types. For example, for operational ships, one metric could be "average gallons of fuel consumed per day of operations". By using standardized metrics, we'll ensure results aren't skewed, leveling the playing field across the squadrons.

How Will It Change Things
It will provide further incentive for commands to find ways to cut energy consumption.

Authors
monstermariner, gm_maier, gm_pat, gm_aerik, Podge, brutzman, Seahawk91, Nimo

Image



Power vs speed for a Spruance destroyer

<https://mmowgli.nps.edu/energy/images/31/1-s2.0-S0029801812000650-gr4.jpg>

Need double the power for 5 more knots once at high speed. Due to hull speed limitations. From the Elsevier article.

- [Previous and Next plan](#)
- [Description](#)
- [Rating](#)
- [Idea Card Chain](#)
- [Who Is Involved](#)
- [What Is It](#)
- [What Will It Take](#)
- [How Will It Change Things](#)
- [Authors](#)
- [Image](#)
- [Author Chat Messages](#)
- [Player Comments](#)



FrontPage

[Edit](#) [Details](#) [Print](#)

Welcome Game Masters! The MMOWGLI Game Masters Wiki supports game and portal administration.

MMOWGLI Game Resources

- [Communications and Outreach](#) provides project details and public-affairs information
- [Game Master Guidance](#)
- [Making a Post in the Game Blog](#) describes how Game Masters make announcements and reports for
- [Mailing Lists](#) for game-related information
- [Operations Security \(OPSEC\) Considerations](#)
- [Testing](#) details and [Ganglia System Monitoring](#) to view server and cluster loading
- [Post-Game Analysis](#)

Additional pages of interest follow.

- [Deploying Applications](#)
- [Fail2Ban](#)
- [Game Configuration](#)
- [Game Play](#)
- [GameMaster Guidance](#)
- [Human Research Protection](#)
- [Infrastructure Configuration](#)
- [Linux Server Optimizations](#)
- [Modeling and Simulation Design](#)
- [MySQL](#)
- [Network Administration](#)
- [Network Security](#)
- [Portal Admin How Tos](#)
- [Savage Lab System Inventory](#)
- [Urchin Web Analytics](#)
- [Vaadin Testbench](#)
- [Wiki Design Notes](#)

Children Pages

- [Apache Client-Server Optimizations](#)
- [Apache Web Server](#)
- [Beta Testers and Analysts](#)

**Open Source Codebase
is available on request**

MMOWGLI design plan 2012

Three phases

- Energy MMOWGLI game
 - Stability, scalability, preparation and support
- Public release of MMOWGLI codebase
 - Ensure secure and repeatably usable so that potential partners don't fork the source
- Additional games and improved features
 - Multiple adaptations and uses, stable growth
 - Data mining and analysis capabilities



2012 phases of work

I. Reliability, testing and execution of next games

- Phase I to ensure that the MMOWGLI game platform has sufficient reliability and scalability to support the even-larger levels of game play expected for Energy MMOWGLI.

II. Public release of repeatable open-source project

- Complete software capabilities needed for repeatably configure/administer new MMOWGLI games, complete public release of open-source software & documentation.

III. Developing additional analytic capabilities

- Capitalize on the value of crowd-sourced data being collected by adding a variety of new features.



MMOWGLI 2012 design priorities

Multiple games for multiple communities

- MMOWGLI Energy, ongoing piracy, maybe STEM?

Sharable game platform for multiple sponsors

- Full baseline, security scrub, publish, governance

Improved game capabilities

- Analysis tools, team play, mobile pads/phones

Repetition and growth

- Build, test, diagnose, evaluate, repeat

Policy and access issues

- Engaging minors, CAC or classified access, IRB release



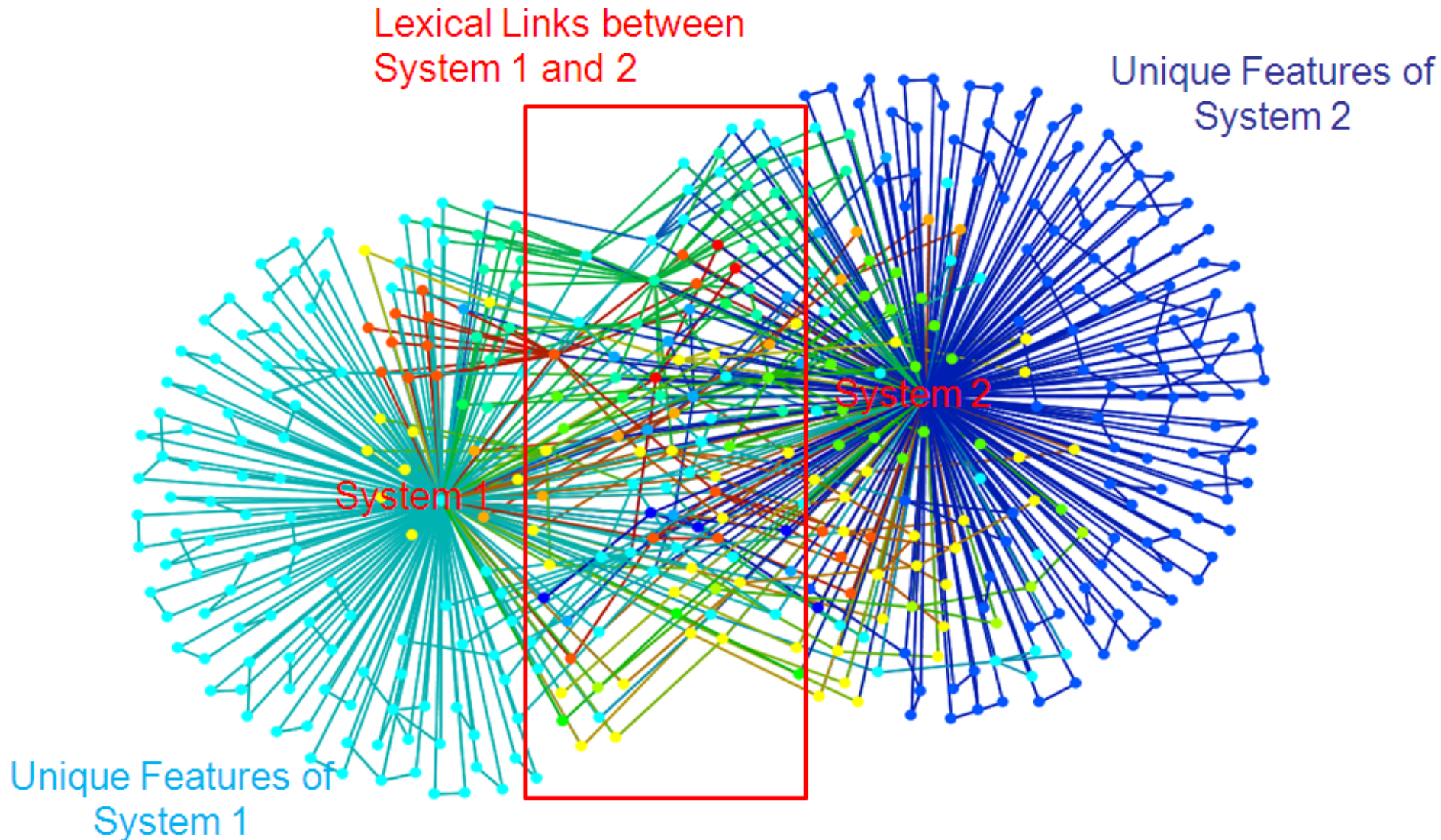
Current work: Lexical link analysis (LLA)

Advanced techniques for cause-and-effect and information-flow analysis have shown excellent value at finding semantic relationships within chat data for other domains.

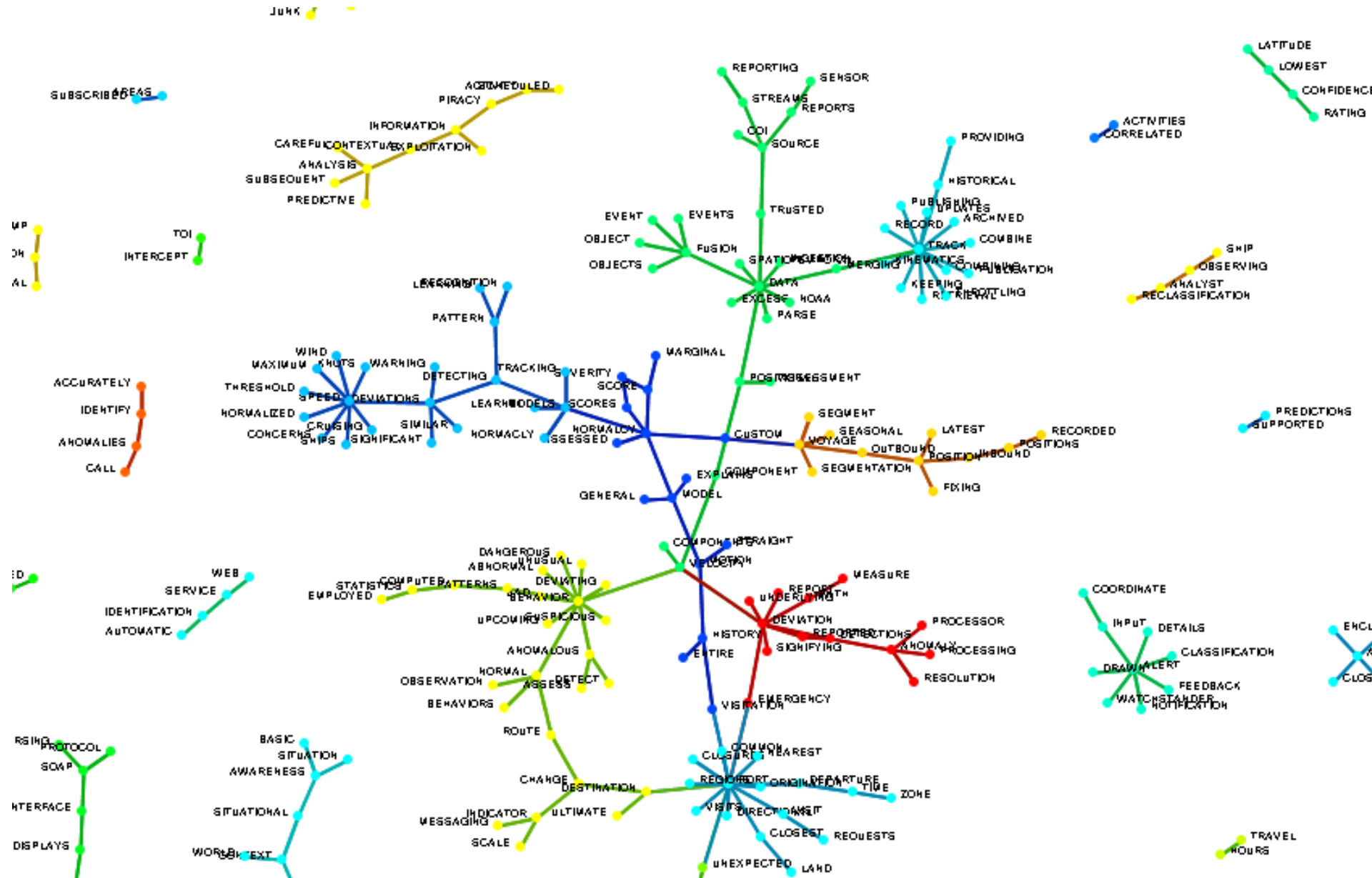
These techniques can be applied to large corpuses of plain-text data such as chat. Even greater semantic results are expected when we apply LLA to the structured data produced by MMOWGLI games.

If careful evolution of game-database schemas is sustained, then these capabilities can be applied both to past and future games. Thus the benefits and insights arising from semantic analysis have the potential to be cumulative across multiple games.

Future work: Lexical Link Analysis (LLA)

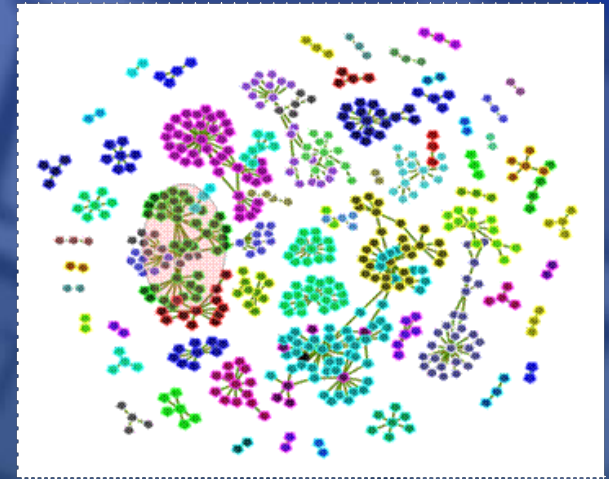
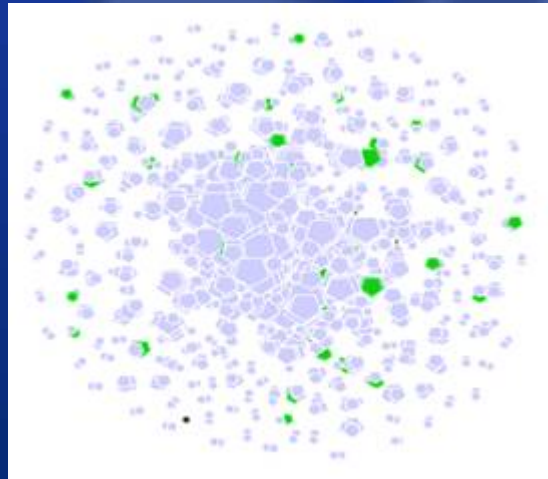
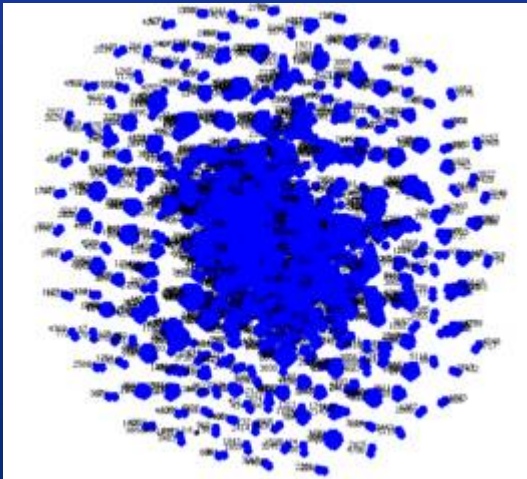


Future work: LLA Features Shown as Word Pairs



LLA report on 2011 Piracy Games

energyMMOWGLI Lexical Link Analysis (LLA) report provides significant additional information on this emerging technique for game-play analysis.



Human research constraints

This work contributes to generalized human knowledge using human subjects

- Governed by formal research protocol with prior review by NPS Institutional Research Board (IRB)
- Social media involves new policy issues

Key issues: privacy, lessen potential for abuse, adults versus minors

Related issue: vulnerability to disclosure of sensitive or classified information

- how to recover if needed

IRB human subjects alternatives

Approved protocol: optionally hidden identity

- Also suitable for known-identity population pool

Navy or government only

- Identity known to other participants
- Restrict access via CAC, hostname or password

STEM, minors

- Special considerations for protecting participants
- More work planned

Where are we going next?



Play the game, check the game

Game Assets	Online Addresses (password protected as appropriate)
Game portal, public and game master	https://mmowgli.nps.edu/portal
piracyMMOWGLI, June 2012 - present	https://mmowgli.nps.edu/piracy
energyMMOWGLI, May 21-25 2012	https://mmowgli.nps.edu/energy
Initial rounds 1-2-3, June-July 2011	http://mmowgli.nps.edu/piracy2011.1
Move November-Alfa, November 2011	http://mmowgli.nps.edu/piracy2011.2
Move November-Bravo, November 2011	http://mmowgli.nps.edu/piracy2011.3

Preparing for a new game

Theming preparation	What is main topic? Who is audience? What are intended outcomes? Checklist documents are available to explore all options.
Game-specific content	Customized for each game, captured and archived in a unique database <ul style="list-style-type: none">• Game name and game theme• Call To Action video or slideset, linked• Call To Action and Situation Report message prose• Logo and page background• Top-level card names, descriptions (e.g. Innovate vs. Status Quo)• Color scheme (~10 complementary/contrasting colors)• Customize initial exemplar action plan on "how to do it"
User profile	Personality profile questions of interest that players can answer <ul style="list-style-type: none">• Location• "Areas of expertise," "Hope to learn about piracy," etc.
Other possible additions	<ul style="list-style-type: none">• Eight award categories are built in, either awarded by moderators or else calculated from the game database as it is played• Other categories are feasible, via database queries or user awards• Pre-game and post-game survey questions• Data-collection hooks for special analysis needs
Optional layout changes	Some further tweaking is an option for customized look and feel <ul style="list-style-type: none">• HTML Cascading Stylesheet (CSS) for layouts and spacing• Web fonts selection http://www.google.com/webfonts• Special images prepared for selection buttons

Labor estimates for game life cycle

Tasks	Work-weeks	Task descriptions, often performed in parallel (<u>continuing to drop</u>)
Theming	1-2	Define project goals, participant profiles and desired game outcomes. Effective game themes and messaging are then decidable.
Video	1-4	Video can effectively communicate game themes and player goals. Game themes must be clear and storyboarded before production.
Game Setup	1	Configuring game database, embedding data assets, public-facing portal. Gain IRB permissions based on player age and identities.
Training	1	Experienced participants selected as game moderators also need familiarization training in order to perform their roles effectively.
Conduct	2	Technical support, trouble report handling, game monitoring and system maintenance. Coordinate external network operations.
Analysis	1-2	In-stride and post-game analysis of information provided by players.
1-week game: goal effort	4-12	Single week of game play, which can be continued if needed.
Longer games: goal effort	1-2	Incremental cost: approximately 2-3 work-weeks support for each added week of play, assumes consistent theming

Conclusions

Customizable crowd-sourcing is practical

- Large scale and small scale, more work to follow

Enterprise networking capabilities are essential

- NPS has high-performance .edu, .mil networks
- Interaction, performance, reliability are critical
- Characteristics are similar to other endeavors, coordination is essential

Protections and due diligence are necessary

- Privacy, human-subjects research, security

Sponsor

U.S. Office of Naval
Research (ONR)

Office of Innovation

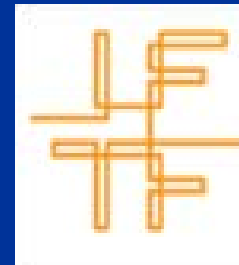


www.onr.navy.mil

Design Partner

Institute for the Future
(IFTF)

Palo Alto California



www.iftf.org

Contact

Don Brutzman

brutzman@nps.edu

<http://faculty.nps.edu/brutzman>

Code USW/Br, Naval Postgraduate School

Monterey California 93943-5000 USA

1.831.656.2149 voice

1.831.656.7599 fax



THE MOVES INSTITUTE
NAVAL POSTGRADUATE SCHOOL

Backup details

for you “know it all” individuals...

NETWORK INFRASTRUCTURE



THE MOVES INSTITUTE
NAVAL POSTGRADUATE SCHOOL

Network infrastructure overview

Classic three-tier architecture

- client, server, back-end database
- Open source, repeatable, best practices
- It works

Complicated set of interrelationships

- Optimization or upgrade of one part affects others
- Testing is essential, spiral process

End-user experience: Web browser

Game software design plays in any browser

- Internet Explorer, Firefox, Chrome, Safari, Opera
- Avoids need for special installation or access
- Avoids software security validation requirements necessary for installation on NMCI systems
- Broadest possible player access
- HTML, javascript, images, video
- Excellent user experience, feels like native app

Testing is tricky but possible

- Multiple techniques used

Akamai.net CDN

Content delivery network (CDN)

Servers at 18,000 internet service providers (ISPs) worldwide with private network

- Intercepts requests to mmowgli.nps.edu
- Static content is cached, returned immediately
- Dynamic database queries etc. passed through
- \$6K/month at low traffic levels

Made our 700KB pages playable on NMCI

- Interesting security benefits (“black hole” for servers)

No problems on other networks, extensive testing



Firewall, routing, external cache

Enterprise firewall and routing by NPS ITACS

- Information Technology Academic Computing Services
- Administers both nps.edu and nps.navy.mil
- Controlled external visibility when operating with Akamai since routing tables are modified

Squid content cache can relieve load on Apache servers for heavyweight static content

- Not needed with Akamai, otherwise may be useful to restore if video content is maintained

Content portal mmowgli.nps.edu/portal

Open-source LifeRay server

- Big community, excellent feature set, high quality
- Also used within NPS enterprise
- Good granularity of user access permissions
- Easy to update content, e.g. Game Blog

Public-facing portal has three components:

- Game info: blog, training, help, trouble, etc.
- Subject-matter resources regarding piracy
- Moderator-only information about game details

FrontPage

<https://mmowgli.nps.edu/portal>

MMOWGLI Game Resources

- [About MMOWGLI](#)
- [Credits and Contact](#)
- [Frequently Asked Questions \(FAQs\)](#)
- [Game Blog](#) announcements
- [Game Instructions](#) (How to play and win!)
- [Game News](#)
- [MMOWGLI Game](#) is closed for 2011. Completed: [Initial moves 1-2-3](#), [Move Alfa](#), and [Move Bravo](#).
- [Press Coverage](#)
- [Terms and Conditions](#)
- [Twitter #mmowgli](#)
- [Video Resources](#)

Somali Piracy Resources

- [Articles](#) about piracy in the news
- [Bookshelf](#) of longer works
- [Games](#) available elsewhere
- [Glossary](#) of terms, what does the jargon mean?
- [Homeland Security Digital Library \(HSDL\)](#) includes [Maritime Domain](#) and [Sea Piracy](#) collections
- [Incidents](#) of relevant interest
- [Information Sources](#) for further investigation
- [Maps](#) illustrating piracy activity
- [Masters theses](#) by graduate students
- [Published papers](#) exploring piracy issues in detail

Apache https game servers

Most widely used codebase, open source

- Many performance parameters can be tuned
- Purchased commercial security certificates

Load-balancing switch splits traffic to improve throughput and avoid bottlenecks

- Past problems with hardware switch, plan retest
- Otherwise can replace with software, tested OK

https servers themselves are virtualized

- Monitoring tools including ganglia, Nagios, others

Performance under load has been excellent



Game access and locking

https username, password can lock access

- Username *fuzzy* password *walrus*
- Can be turned on or off by server administrator
- Game administrators can also set “read only” game

Player must then use personal login

- Initial visit: answer questions, create account
- Different user database for each game
- Naming convention: *gm_firstname* for game masters

Player-submitted images, video

Images maintained/cached on NPS server

- Also can be cached by Akamai
- Used for annotating player Action Plans

Video submissions made via YouTube url links

- Simplifies compatibility issues with various file-format encodings
- Provided best performance on NMCI systems
- Could be cached within infrastructure otherwise, which would eliminate possibility of loss

Game cluster

CentOS Linux, 8 blades, also virtualized
Java servlets for client-server communications

Tomcat container for multiple players

- Currently the bottleneck point for capacity
- Can have multiple game containers on one box

Hidden internal LAN for maximum throughput

- Also increases security

Message queue and message push

Shared message queue reflects all database additions, player status, etc. among servers

- ApacheMQ open source
- Keeps game play synchronized
- Opportunity for further monitoring, reliability

Message push adds to game interactivity

- Players are more aware of other player activity
- Can reduce player interaction if too aggressive
- Continued testing of both browser performance and user experience is important, find balance



DATA INFRASTRUCTURE



THE MOVES INSTITUTE
NAVAL POSTGRADUATE SCHOOL

Sets of data collected by game

Game configuration assets

User profile

- Personal Identifying Information (PII), encrypted (name and email address optional, maybe correct)
- In-game user name, background, questions of interest, modifiable by each player

Idea cards: plain text, parents/children, tags

Action plans: text, authors, multimedia assets

Computed results: awards, leader board, etc.

Human research constraints

This work contributes to generalized human knowledge using human subjects

- Governed by formal research protocol with prior review by NPS Institutional Research Board (IRB)
- Social media involves new policy issues

Key issues: privacy, lessen potential for abuse, adults versus minors

Related issue: vulnerability to disclosure of classified information, how to recover if needed

Data access

Access rules set by IRB formal protocol

- Game masters can hide or decorate cards
- Only game administrators (3 people) are allowed to decrypt PII, set permissions, restart game, etc.

Once game is closed, access rules allow formal request and release of sanitized game data (no-PII) to other researchers

MySQL database

Open-source, high-performance, popular

- many tools and software APIs available

One database per overall game interval

- multiple tables for different sets of data

Viewable via game itself or by admin tools

New feature: export Idea card and Action Plan data into HTML, XML for easier presentation and analysis

Search

Search implemented using Apache Lucene engine

- Powerful, open source, highly configurable

Simple interface: enter keywords

- Searches idea cards, action plans, user profiles
- Word cloud shows list of most popular terms
- Implemented using word roots, e.g. pirate/piracy
- Scrollable results for fast network response
- Selecting a result brings user to that resource

Links included, inserted for text throughout

Encourage rapid brainstorming, idea synthesis



THE MOVES INSTITUTE
NAVAL POSTGRADUATE SCHOOL

No problems with user inputs (yet?)

We have careful design, protocol, procedures

- Independent review by SPAWAR privacy officer

No problems noted in MMOWGLI games 1,2,3

- No personal abuse was found or reported
- No advertising spam or indiscriminate profanity
- No sensitive or classified information

Reasons for social success

- Users have ability to report problems
- Overhead to hide bad words is easy for game masters
- Sense of community, awareness of partial identity are sufficient motivators to play game constructively

Daylight encourages good behavior!



Hibernate database API

Java open-source API for database access

- There are many such APIs
- Can be adapted to other databases, if ever needed

Special support for persistence

- Gives users consistent state throughout
- e.g. if connection dropped, return to right page
- All information sent by users is saved immediately

Performance is excellent

- Must catch all possible exceptions for reliability

Reliability, performance design issues

We do not delete any database record

- But they can be “hidden”
- This avoids broken database integrity pathologies
- After-action analysis then has full trace capability

TODO: save action plan editing history

- Allow rollback or retrieval of prior entries
- Perhaps offer diff capability to authors

Database reliability, performance exceptional

SOFTWARE ARCHITECTURE MONITORING AND TESTING



THE MOVES INSTITUTE
NAVAL POSTGRADUATE SCHOOL

Vaadin toolkit

Java-based open source GUI programming

- Classic approach. Requires special skill and care.

Compiles into HTML, javascript, .WAR archives

- Does not produce standalone applications
- Internals use Google Web Toolkit (GWT) which deconflicts the widespread problem of display inconsistencies between different browsers
- Testing is tricky, however

Runs well on different browsers, few “gotchas”

- IE 7/8, Firefox, Chrome, Safari, Opera

Game update, deployment

Developers check test server before going live

- .war Web Archive file is built and copied

Deployed to one or more cluster servers

- Each supports 1 Tomcat container per game

Failure recovery

- Daily updates have been helpful for bug fixes
- Can also selectively reboot one container at a time without having to restart entire game

Deployment prerequisites

NPS has a highly expert team doing all this

- Work requires exceptional attention to detail
- Usually performed via console command line

System configuration and administration is performed in tandem with code development

- Hard to quantify the effort but significant
- Configuration documented on game master portal

As final architecture stabilizes, some tasks can be exposed within the game admin menu

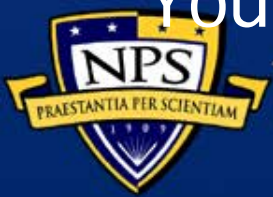
- Unix command-line expertise still remains essential

Error-correction principles

Process for robustly handling all exceptions, errors

- Detection
- Logging
- Notification reports
- Reproduce the problem , when possible
- Fix software or configuration
- Test and revise until fixed
- Add diagnostics and unit tests, when possible
- Recovery, when possible
- Deploy new build, repeat

“You get what you inspect, not what you expect.”



Key points

Experience continues to bear out that current limits must be surpassed before new limits (meaning new problems) become evident.

#1 project need: continuous game play

- **Because players stress the system**
- **Because players do unexpected things**

We perform two types of testing:

- Interface testing, load testing

User interface testing

Primarily by developers

Limited success getting test reports from others

Scrupulously reporting, recording bugs

Once a certain page is stable, an automated test can easily be recorded by using Firefox

- Repeatable by humans or test tools identically

Goal: build a suite of tests for each game page

- Need test refresh as part of development cycle

Load testing by tools

Vaadin Testbench uses Selenium toolkit to record example sessions and play them back

- Can launch 30-60 sessions in NPS lab spaces, but:
- Easy to create/update tests, tedious to perform

BrowserMob

- Commercial service (\$\$) that runs tests on demand from a cloud architecture
- Tedious to program and tune tests, but possible

Apache Jmeter injection of session playbacks

- Open source, configurable, under investigation



Load testing by people

Professional load testers

- \$20-\$50 per hour contracts available
- Maybe time consuming to administer and digest
- Hard to generate large numbers of players, which is what we most need

Prefer hiring game moderator 1-2 days / week

- Proven performer, track bugs, assist developer
- Also moderate anti-piracy game with controlled population, providing regular focused feedback

Contact

Don Brutzman

brutzman@nps.edu

<http://faculty.nps.edu/brutzman>

Code USW/Br, Naval Postgraduate School

Monterey California 93943-5000 USA

1.831.656.2149 voice

1.831.656.7599 fax



THE MOVES INSTITUTE
NAVAL POSTGRADUATE SCHOOL

Massively Multiplayer Online War Game Leveraging the Internet

mmoagli



I'm ready to try mmoagli when is the next session?



DEFEND
What new risks could arise that would transform the Somali pirate situation?



COUNTER
Challenge this idea



NEW RISK
What new risks might be out there?

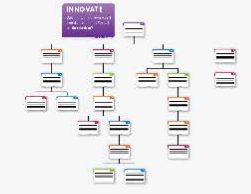


SUPER INTERESTING
Build less expensive ships, kinds that are in between the massive ships we have now and unmanned robot ships. Fast. Capable. Inexpensive.
gm_Mike



INNOVATE
What new resources could turn the tide in the Somali pirate situation?

ADAPT
Take this idea in a different direction



EXPAND
Build on this idea to amplify its impact



MMOWGLI is a social-network tool for crowd-sourced brainstorming, sponsored by the Office of Naval Research (ONR) for the United States Navy. We built an innovative open-source Web engine to explore strategy development and expand community engagement in complex geopolitical problems.



mmowgli.nps.edu/game-blog