

05/09/2012

Social Semantics for an Effective Enterprise

Abstract

An evolution of the Semantic Web, the Social Semantic Web (s2w), facilitates knowledge sharing with “useful information based on human contributions, which gets better as more people participate.”[1] The s2w reaches beyond the search box to move us from a collection of hyperlinked facts, to meaningful, real time context. When focused through the lens of Enterprise Search, the Social Semantic Web facilitates the fluid transition of meaningful business information from the source to the user. It is the confluence of human thought and computer processing structured with the iterative application of taxonomies, folksonomies, ontologies, and metadata schemas.

The importance and nuances of human interaction are often deemphasized when focusing on automatic generation of semantic markup, which results in dissatisfied users and unrealized return on investment. Users consistently qualify the value of information sets through the act of selection, making them the de facto stakeholders of the Social Semantic Web. Employers are the ultimate beneficiaries of s2w utilization with a better informed, more decisive workforce; one not achieved with an IT miracle technology, but by improved human-computer interactions.

Johnson Space Center Taxonomist Sarah Berndt and Mike Doane, principal owner of Term Management, LLC discuss the planning, development, and maintenance stages for components of a semantic system while emphasizing the necessity of a Social Semantic Web for the Enterprise. Identification of risks and variables associated with layering the successful implementation of a semantic system are also modeled.

1. Tom Gruber (2006). “Where the Social Web Meets the Semantic Web”. Keynote presentation, International Semantic Web Conference (ISWC), November 7, 2006.

Social Semantics for an Effective Enterprise



Photo by Dane Penland, Smithsonian Institution

Sarah Berndt
JSC Taxonomist, DB Consulting
sarah.berndt@nasa.gov
@JSCTaxo

Mike Doane
Principal owner, Term Management, LLC
mike.doane@gmail.com
@TermManagement



- I. The State of Search
- II. Behind the Interface
- III. Additional Tools for Social Semantics
- IV. Enterprise
- V. Back-up Slides
 - A. Variables Affecting the System
 - B. Additional Considerations

Photo by Julio Cortez/ AP

Search is inside a box.
We search to get results.
Search + Query = Result(s).
Ideally, the data reported in the result offers an answer, but additional context is usually needed.



Search JSC international sp

- [International Space Agencies](#) (filtered)
- [International Space Station](#) (filtered)
- [International Space Station Alpha](#) (filtered)
- [International Space Station Assembly Mission](#) (filtered)
- [International Space Station documents](#) (filtered)
- [International Space Station Expedition 1](#) (filtered)
- [International Space Station Expedition 10](#) (filtered)
- [International Space Station Expedition 11](#) (filtered)
- [International Space Station Expedition 12](#) (filtered)



Last Update: 4/18/2009
Curator: Orlando Bongat
Responsible NASA Official: Allan Stilwell

An evolution of the Semantic Web, the Social Semantic Web (s2w), facilitates knowledge sharing with “useful information based on human contributions, which gets better as more people participate.” [1]

The s2w reaches beyond the search box to move us from a collection of hyperlinked facts, to meaningful context.

1. Tom Gruber. “Where the Social Web Meets the Semantic Web”. Keynote presentation, International Semantic Web Conference (ISWC), November 7, 2006.



Search JSC [space station expedition 1]

Search Results 1 - 10 of about 1090 for International Space Station Expedition 1 (3.2 seconds) Sort by date

Limit To ?

Show Full Tree

Content

- Document
- PDF
- PowerPoint
- Spreadsheet
- Text
- Web Page
- XML

Show all file types

Facilities & Labs

- Launch Pad 39A

Functional Areas

- Safety
- Engineering
- Evaluation
- Experiments

Programs & Missions

- Expedition 01
- On orbit

Research Areas

- Carbon

Did you find what you were looking for?

International Space Station Expedition 01. [International Space Station Expedition 01.](#) [ISS Expedition Missions](#) » [Expedition 01](#) ?

Commander William Shepherd and Flight Engineers Yuri Gidzenko and Sergei Krikalev were the first residents of the International Space Station. Their mission lasted from October 2000 to March 2001.



Related Information ? (Hide)(Show All)

Crewed by	Related
Gidzenko, Yuri P. Krikalev, Sergei K. Shepherd, William M.	Autonom...

Soyuz TM31

of the International Space Station. Their mission lasted

- ISS Expedition One Crew** [Relevance Score: 10 of 10]
Time in Orbit. How does this work? Mission Patch. **Expedition 1** Crew Patch.
Mission Overview. Vehicle: Russian Soyuz Rocket ...
spaceflight.nasa.gov/station/crew/exp1/index.html - 22k - 2004-04-04 - [Request Removal](#)
- [PDF] **Expedition 1** crew to bring station to life [Relevance Score: 10 of 10]
... VOL. 39, NO. 21 LYNDONB . JOHNSONSPACECENTER , HOUSTON , TEXAS
Expedition 1 crew to bring station to life ... **Expedition 1** Crew ...
www.jsc.nasa.gov/history/roundups/issues/2000-10-20.pdf - 2004-11-26 - [Request Removal](#)
- ISS Assembly Flight 2R - Crew Menu** [Relevance Score: 10 of 10]
Expedition 1 Crew Menu. During the four-month stay on the International Space Station, the **Expedition 1** crew will be on ...

We ask to get answers.
“Ask” enhanced with social semantics = answer.
It is a conversation, an iterative process of asking, finding and learning.
The answer changes the question.

Behind the Interface



- I. Semantic Search, Simplified
- II. Components of the Semantic System
- III. How are Rulebases Social?
- IV. Additional Tools for Social Semantics
- V. Enterprise

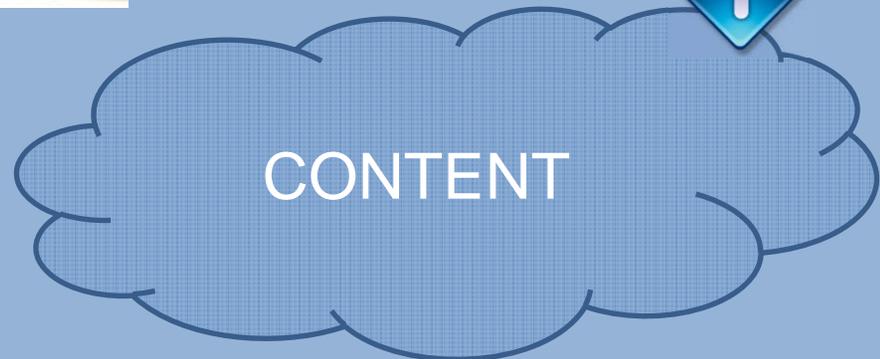
Semantic Search, Simplified



Semaphore
Ontology Manager



Google Search
Appliance



Components of the Semantic System



[-] Gemini Program
[-] Ground Operations
[-] International Space Station Program
[-] Assembly stages
[-] Elements (ISS)
[-] International Space Station Missions
[-] ISS Expedition Missions
Expedition 01
Expedition 02
Expedition 03
Expedition 04
Expedition 05
Expedition 06
Expedition 07
Expedition 08
Expedition 09
Expedition 10
Expedition 11
Expedition 12
Expedition 13
Expedition 14
Expedition 15
Expedition 16
Expedition 17
Expedition 18
Expedition 19
Expedition 20
Expedition 21
Expedition 22

TAXONOMY, ONTOLOGY, & TERM METADATA LIBRARY

- Controlled Vocabulary
 - Hierarchy
 - Preferred terms
- Ontology
- Equiv Relationships
 - Non-Preferred Terms

STS-135

Class: SpaceShuttleProgram

Hierarchical

Type	Term
BT	Space Shuttle crewed missions

Associative

Type	Term
Crewed by	Gidzenko, Yuri P.
Crewed by	Krikalev, Sergei K.
Crewed by	Shepherd, William M.
RT	Autonomous Biological System
Supported by	ISS Assembly Mission 2R
Supported by	Soyuz TM31
Supported by	STS-102

Equivalence

Type	Term
UF	2R crew
UF	Expedition 1
UF	Expedition I
UF	International Space Station Expedition 1
UF	International Space Station Expedition I
UF	ISS Expedition 1
UF	ISS Expedition I

Components of the Semantic System



TAXONOMY, ONTOLOGY, & TERM METADATA LIBRARY

- **CV** developed through user interviews, research, document review, feedback. *Provides foundation for further exploration.*
- **Ontology** developed as way to extend taxonomy, connect concepts across multiple Directorates. *Allows many types of contextual relationships to exist.*
- **Term Relationships** added to further enhance term usage. *Encourages the semantic exploration of search and retrieval.*

Type	Term
BT	Space Shuttle crewed missions

Type	Term
Crewed by	Gidzenko, Yuri P.
Crewed by	Krikalev, Sergei K.
Crewed by	Shepherd, William M.
RT	Autonomous Biological System
Supported by	ISS Assembly Mission 2R
Supported by	Soyuz TM31
Supported by	STS-102

Type	Term
UF	2R crew
UF	Expedition 1
UF	Expedition I
UF	International Space Station Expedition 1
UF	International Space Station Expedition I
UF	ISS Expedition 1
UF	ISS Expedition I



Components of the Semantic System (cont'd.)

Preferred terms generate rulebases!

Rulebases are informed by the taxonomy and ontology, the proximity and location of terms, and different weights to enhance the accuracy of Classification.

```
<!-- TITLE RULES FOR NPTs -->
- <combine weight="100" label="link.Missions.STS-133.31921_TITLE_NPT" _key="k815323">
  <!-- multi-word NPT - title -->
  - <max not="0" scale="0" weight="100" _key="k815325">
    - <phrase case="0" field="title" foreach="0" weight="25" not="0" stem="1" _key="k815326">
      - <any case="0" not="0" weight="100" stem="1" _key="k815327">
        <text case="0" field="title" weight="100" not="0" data="S T S" stem="1" _key="k815328" />
        <text case="0" field="title" weight="100" not="0" data="S.T.S." stem="1" _key="k815329" />
        <text case="0" field="title" weight="100" not="0" data="STS" stem="1" _key="k815330" />
      </any>
      <text case="0" field="title" weight="100" not="0" data="133" stem="1" _key="k815331" />
    </phrase>
  - <near case="0" count="2" foreach="0" weight="20" field="title" not="0" stem="1" _key="k815332">
    - <any case="0" not="0" weight="100" stem="1" _key="k815333">
      <text case="0" field="title" weight="100" not="0" data="S T S" stem="1" _key="k815334" />
      <text case="0" field="title" weight="100" not="0" data="S.T.S." stem="1" _key="k815335" />
      <text case="0" field="title" weight="100" not="0" data="STS" stem="1" _key="k815336" />
    </any>
    <text case="0" field="title" weight="100" not="0" data="133" stem="1" _key="k815337" />
  </near>
  - <sentence case="0" field="title" not="0" weight="15" stem="1" _key="k815338">
    - <any case="0" not="0" weight="100" stem="1" _key="k815339">
      <text case="0" field="title" weight="100" not="0" data="S T S" stem="1" _key="k815340" />
      <text case="0" field="title" weight="100" not="0" data="S.T.S." stem="1" _key="k815341" />
      <text case="0" field="title" weight="100" not="0" data="STS" stem="1" _key="k815342" />
    </any>
    <text case="0" field="title" weight="100" not="0" data="133" stem="1" _key="k815343" />
  </sentence>
</max>
- <max not="0" scale="0" weight="100" _key="k815344">
  - <phrase case="0" field="title" foreach="0" weight="25" not="0" stem="1" _key="k815345">
    - <any not="1" _key="k815346">
      <text data="Space" _key="k815347" />
    </any>
    <text case="0" field="title" weight="100" not="0" data="Shuttle" stem="1" _key="k815348" />
```



Components of the Semantic System (cont'd.)

Preferred terms generate rulebases!

As the taxonomy and ontology are further built out and refined, the rulebases can be refined to provide further clarity and context.



```

<!-- TITLE RULES FOR NPTs -->
- <combine weight="100" label="link.Missions.STS-133.31921_TITLE_NPT" _key="k815323">
  <!-- multi-word NPT - title -->
  - <max not="0" scale="0" weight="100" _key="k815325">
    - <phrase case="0" field="title" foreach="0" weight="25" not="0" stem="1" _key="k815326">
      <max not="0" weight="100" stem="1" _key="k815327">
        "0" field="title" weight="100" not="0" data="STS" stem="1" _key="k815328" />
        "0" field="title" weight="100" not="0" data="S.T.S." stem="1" _key="k815329" />
        "0" field="title" weight="100" not="0" data="STS" stem="1" _key="k815330" />
        "0" field="title" weight="100" not="0" data="133" stem="1" _key="k815331" />
      count="2" foreach="0" weight="20" field="title" not="0" stem="1" _key="k815332">
        "0" field="title" weight="100" not="0" data="STS" stem="1" _key="k815333">
        "0" field="title" weight="100" not="0" data="S T S" stem="1" _key="k815334" />
        "0" field="title" weight="100" not="0" data="S.T.S." stem="1" _key="k815335" />
        "0" field="title" weight="100" not="0" data="STS" stem="1" _key="k815336" />
        "0" field="title" weight="100" not="0" data="133" stem="1" _key="k815337" />
        "0" field="title" weight="15" stem="1" _key="k815338">
        "0" field="title" weight="100" stem="1" _key="k815339">
        "0" field="title" weight="100" not="0" data="STS" stem="1" _key="k815340" />
        "0" field="title" weight="100" not="0" data="S.T.S." stem="1" _key="k815341" />
        "0" field="title" weight="100" not="0" data="STS" stem="1" _key="k815342" />
        "0" field="title" weight="100" not="0" data="133" stem="1" _key="k815343" />
      </max>
    - <max not="0" scale="0" weight="100" _key="k815344">
      - <phrase case="0" field="title" foreach="0" weight="25" not="0" stem="1" _key="k815345">
        - <any not="1" _key="k815346">
          <text data="Space" _key="k815347" />
        </any>
        <text case="0" field="title" weight="100" not="0" data="Shuttle" stem="1" _key="k815348" />
    </max>
  </combine>

```

- ⊞ Gemini Program
- ⊞ Ground Operations
- ⊞ International Space Station Program
 - ... Assembly stages
 - ... Elements (ISS)
 - ⊞ International Space Station Missions
 - ⊞ ISS Expedition Missions
 - ... Expedition 01
 - ... Expedition 02
 - ... Expedition 03
 - ... Expedition 04
 - ... Expedition 05
 - ... Expedition 06
 - ... Expedition 07
 - ... Expedition 08
 - ... Expedition 09
 - ... Expedition 10
 - ... Expedition 11

How are Rulebases Social?



User feedback and comments/interactivity are used to refine the ontology, which alter the rulebases and affect the search algorithm.

Feedback Tool



JSC KNOWLEDGE ONLINE

Search JKO

Home Case Studies Resources Historical Records Storytelling Voices Taxonomy SSPWeb Knowledge-Based Risks Who To Call

Taxonomy Home
Browse By Hierarchy
Browse By A-Z Index
Taxonomy Search
Suggest a Term

JSC Taxonomy

International Space Station Program

[Programs & Missions](#) » International Space Station Program

Description

Suggest a Term Description?

Suggest an External Link?

Additional Information

has Acronym

- ISSP (International Space Station Program)

Use For

- ISSA (International Space Station assembly)

Narrower Terms

- [Assembly stages](#)
- [Elements \(ISS\)](#)
- [International Space Station Missions](#)
- [Transportation/Logistics \(ISS\)](#)

Feedback (0)

No feedback exists for this term.

[JSC Search \(Keyword\)](#) | [JSC Search \(Filtered\)](#)

International Space Station Program

Suggest an Image?

Related Information

Has vehicle

- [International Space Station](#)

Related To

- [Cygnum](#)
- [European Automated Transfer Vehicle](#)
- [Extravehicular Mobility Unit](#)
- [ISS Orbit](#)
- [Progress \(Spacecraft\)](#)
- [Soyuz TMA](#)
- [X-38 crew return vehicle](#)

Supported

- [H-II Transfer Vehicle](#)

Related To

- [European Automated Transfer Vehicle-2](#)
- [European Robotic Arm](#)
- [Thermal barrier](#)

[Web Accessibility and Policy Notices](#) | [JSC Home](#)

Responsible NASA Official: [Jean E. Engle](#) | Curator: [Allan Stilwell](#) | [Site Administration](#)

Last Modified: 02/29/2012 | Visits: 421715

Flexibility



An additional example of social semantics for the enterprise is the utilization of semantic components in various systems. In this example, content tagging with taxonomy terms.

Lesson Information

Title:

Abstract: ABC ✓

Lesson Date: (format mm/dd/yyyy)

Additional Categories

Please select the categories that best describe the functional area to which your Lesson Learned applies:

Type the first few letters of the topic:

Selected Terms

Note: synonyms of selected terms will be removed from the autocomplete list.

If you do not know the topic, you can browse the taxonomy below. If a topic has sub-topics, they will appear below the topic when selected.

Facilities & Labs

- | | | | |
|---|--|--|--|
| <input type="checkbox"/> Administration Support Facility | <input type="checkbox"/> Animal Care Facility | <input type="checkbox"/> Anthropometry & Biomechanics Facility | <input type="checkbox"/> ARES Infrastructure Facility |
| <input type="checkbox"/> Astromaterials & Exploration Research Facility | <input type="checkbox"/> Astromaterials Curation Facility | <input type="checkbox"/> Astronaut Quarantine Facility | <input type="checkbox"/> Auxiliary Chiller Facility |
| <input type="checkbox"/> B-7 Collaborative Engineering Center | <input type="checkbox"/> Central Computing Facility | <input type="checkbox"/> Central Radio Communications Facility | <input type="checkbox"/> Central Tape Storage Facility |
| <input type="checkbox"/> Childcare Facility | <input type="checkbox"/> Classified Waste Disposal Facility | <input type="checkbox"/> Cloudcroft Telescope Facility | <input type="checkbox"/> Construction Materials Staging Facility |
| <input type="checkbox"/> Emergency Operations Center | <input type="checkbox"/> Energy Systems Equipment Storage Facility | <input type="checkbox"/> Engineering Computation Facility | <input type="checkbox"/> Environmental Support Facility |
| <input type="checkbox"/> Film Repository Facility | <input type="checkbox"/> Fire Operations Facility | <input type="checkbox"/> General Support Facility | <input type="checkbox"/> Graphics Research & Analysis Facility |
| <input type="checkbox"/> Grounds Equipment Maintenance Facility | <input type="checkbox"/> Habitability Design Center | <input type="checkbox"/> Hazardous Material Storage Facility | <input type="checkbox"/> Human Research Facility |
| <input type="checkbox"/> Hypervelocity Impact Technology Facility | <input type="checkbox"/> Image Science & Analysis Laboratory Facility | <input type="checkbox"/> Installation Support Facility | <input type="checkbox"/> Integrated Planning System |
| <input type="checkbox"/> JSC Language Education Center | <input type="checkbox"/> JSC Scientific & Technical Information Center | <input type="checkbox"/> Laboratories | <input type="checkbox"/> Laboratory Support Facility |
| <input type="checkbox"/> Landing facilities | <input type="checkbox"/> Launch sites | <input type="checkbox"/> Lighting Environment Test | <input type="checkbox"/> Logistics Support Facility |

Classification Verification, Former



1997	1	0	NASA - Archive	http://www.nasa.gov/mission_pages/shuttle/shuttlen
1998	1	0	Classified Listing - Television Service Req	http://ird.jsc.nasa.gov
1999	366	0	NASA - Mars Rovers Mission Using Cloud	http://www.nasa.gov/mission_pages/mer/news/mer2
2000	1		HIGH PERFORMANCE COMPUTING	
2001	2		EO 13035 ADVISORY COMMITTEE ON HIGH	http://nodis3.gsfc.nasa.gov/displayEO.cfm?id=EO_13035
2002	3		NASA - Mars Rovers Mission Using Cloud	http://www.nasa.gov/mission_pages/mer/news/mer2
2003	4		INTERVIEW TRANSCRIPT	http://www.jsc.nasa.gov/history/oral_histories/Garm
2004	5		Recent Advances in Photonic Devices for	http://science.nasa.gov/media/medialibrary/2000/04/
2005	6		IRD Overview - Feb 2010 update	http://ird.jsc.nasa
2006	7		JSC Today - Monday, September 14, 2009	http://www6.jsc.nasa.gov/pao/news/jsctoday/archive
2007	8		Ian Lumb	
2008	9		APOLLO EXPERIENCE REPORT - ONBOARD	
2009	6	0	Home - Application & Database Services	
2010	1		Home - Application & Database Services	
2011	2		Application & Database Services	
2012	3		Application & Database Services - Applica	
2013	4		ACB Resources - IRD Application & Datab	
2014	5		Application & Database Services	
2015	566	0	Home - Application Control Board (ACB)	

	March Dev OM 3.3.1 GSA 6.12 Named Entity	Dec Dev OM 3.2.2 GSA 6.12 Generic Rulebase	Dec Dev OM 3.2.2 Generic Rulebase	Sept OM 3.2.4 Named Entity	Aug OM 3.2.4: Named Entity	June 3.2.2
1	No classification: Information technology (list from Dec 2011)					
2	Total Term Count	256	252	253	257	255
3	Non-Classifying Terms Count	60	119	116	57	56
4	% Terms Classifying	77%	63%	64%	88%	88%
5	Computing services	X	X	X		X
6	Applications & database services	X				
7	Policies (Computing)		X	X	X	X
8	Application Control Board	X				
9	Application Control Board Development Standards	X				
10	System for Tracking & Registering Applications & Websites	X				

Classification Verification, Contemporary



Semaphore Web Administration

Welcome, Sarah Berndt!

- Home
- RULEBASE
 - Test
 - Test Evaluation
- Map
- TAXONOMY
 - Report
 - Manage
 - Comments
- CLASSIFICATION
 - Report
 - Analysis
 - Status

Rulebase Map

Below is the Rulebase Map that shows which terms have been commented on or have had template change.

Add Comment

- + Facilities & Labs ⓘ ↗
- Functional Areas ⓘ ↗
 - Information technology ⓘ ↗
- + Mission Operations ⓘ
- Procurement ⓘ ↗
- + Research ⓘ
- People ⓘ ↗
- Programs & Missions ⓘ ↗
- + Related Organizations ⓘ ↗
- + Research Areas ⓘ ↗
- + Systems & Equipment ⓘ ↗

Rulebase Map Template

This was changed to the **Named Entity** template on 3/22/2012 to address the following:
The IT branch tends to have proper noun names.

Classification Analysis

Please select two reports to compare: and

- DEV - 2/23/2012 1:39:3
- DEV - 3/12/2012 10:53:3
- DEV - 3/13/2012 10:07:3
- DEV - 3/20/2012 12:37:3
- PROD - 3/20/2012 1:28:3
- DEV - 3/22/2012 1:07:5
- DEV - 3/29/2012 1:54:2

Web Accessibility and Policy Notes
JSC Home

Last Modified

Curator: Orlando Bongal

Define: Enterprise



1: a project or undertaking that is especially difficult, complicated, or risky

2 : readiness to engage in daring or difficult action : initiative <showed great *enterprise* in dealing with the crisis>

3a : a unit of economic organization or activity; *especially* : a business organization *b* : a systematic purposeful activity <agriculture is the main economic *enterprise* among these people>

Merriam -Webster

All of the Above!



Photo by Brian McDonald, Bayonne New Jersey

Backup Slides



I. Variables Affecting the System and Considerations for Effectiveness

Variables Affecting the System



I. System Access

II. Software Upgrades

III. Staged Relaxation

A. Default = stringent classification strategy, then make classes progressively more lenient until the results are acceptable. Modifications include: Standard, Named Entity, Named Entity Sentence, Named Entity Paragraph, Named Entity No Preclusion, and Named Entity Single Boosted

Considerations for Effectiveness



- I. Licensing
- II. Search Logs
- III. Unique Searches
 - A. User Expectations
- IV. User Authentication
- V. Social Media

JSC Search Hits



	A	B	C	D	E	F	G
1	<i>N2ID are Semaphore terms</i>						
2	Top 100 Queries w/results	# Occurrences		Top 100 Keywords	# Occurrences		# Occurrences
3	shuttle	3274		shuttle	3283		4
4	Engineering Drawing Control Center	557		center	844		3
5	Electronic Document Management System	381		control	586		3
6	Quality Assurance Record Center	282		engineering	570		3
7	Flight Assignment Working Group	238		drawing	561		2
8	Flight Planning Working Group	220		flight	467		2
9	edms	207		group	463		2
10	Receiving Inspection	197		working	461		2
11	pandion	190		system	404		2
12	Safety Review Panel	169		management	402		2
13	techtrans	20		document	392		2
14	MPLM	18		electronic	382		2
15	space	15		quality	285		2
16	irduploads	14		assurance	285		2
17	N2ID16683	13		record	282		2
18	bbpt	12		assignment	240		2
19	IRDUuploads	12		planning	225		2
20	ratification	11		edms	209		2
21	MLM overview	11		inspection	200		2
22	N2ID15213	11		receiving	197		2
23	digital pre assembly	10		pandion	190		2
24	fpwg	10		review	185		2
25	James Heslin	9		panel	178		2
26	BMRRM	9		safety	176		2
27	starport	9		jsc	158		2
28	swan shon	9		and	84		2