



ULSGEN

(Uplink Summary Generator)

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Agenda

- Uplink summary process and how we use software to streamline the process
- Software design concept
- Adaptation concept in a multi-mission environment
- ULSGEN architecture
- ULSGEN in operation
- Conclusion



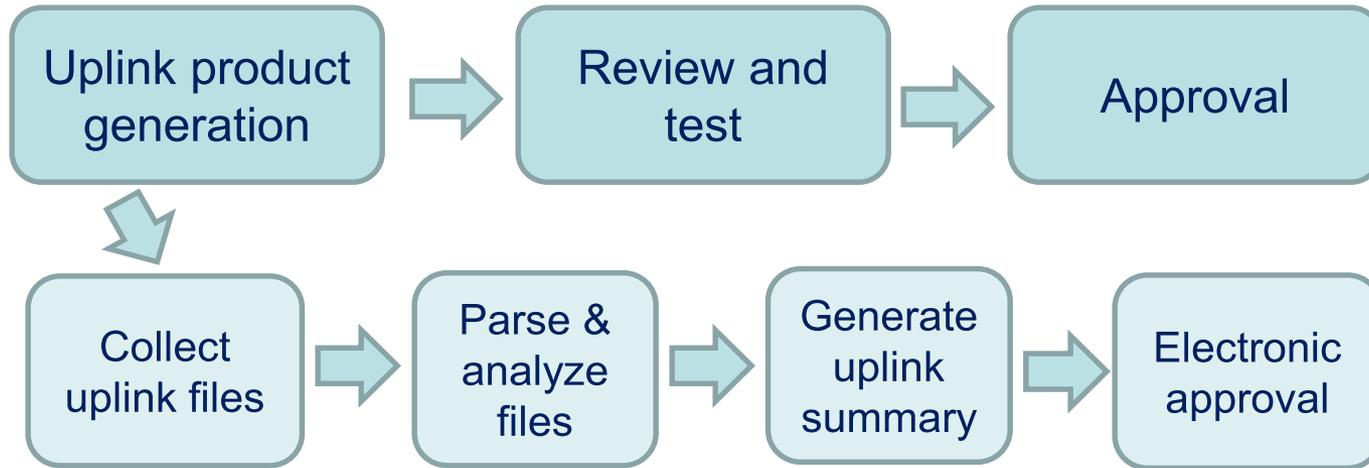
Uplink Summary



- Uplink is an important part of S/C operation.
- Before radiation, everyone involved is required to review the uplink products.
- Uplink files are parsed and analyzed to generate an uplink summary for review.
- Spacecraft operations personnel view this summary as a final check before actual radiation of the uplink data.



Uplink Summary Process



- Introducing software (ULSGEN) in this process to:
 - Collect uplink files and arrange their order in a convenient interface
 - Parse & analyze uplink files to generate an uplink summary in mission-specific form
 - Start electronic signature cycle with notifications
 - Collect review comments and signatures
 - Handle rejection and its notifications
 - Configuration manage changes made to the uplink summary
 - Generate reports and an XML file for radiation preparation
 - Archive uplink summary data and provide ability to search that data



Software Design Concept

- Code reuse to reduce development effort
 - Take reusable pieces from other implementations
 - Use developers from other similar tasks
- Multi-tier implementation for flexibility
 - Separate UI, business logic, and data layer
- Browser based app to simplify deployment
- Web services for automation
 - Both REST and SOAP services
 - REST services for automation via scripting
- Authentication and authorization to enhance security
 - LDAP-based authentication
 - Use secured connections (HTTPS)
 - Authorization via workspace permissions

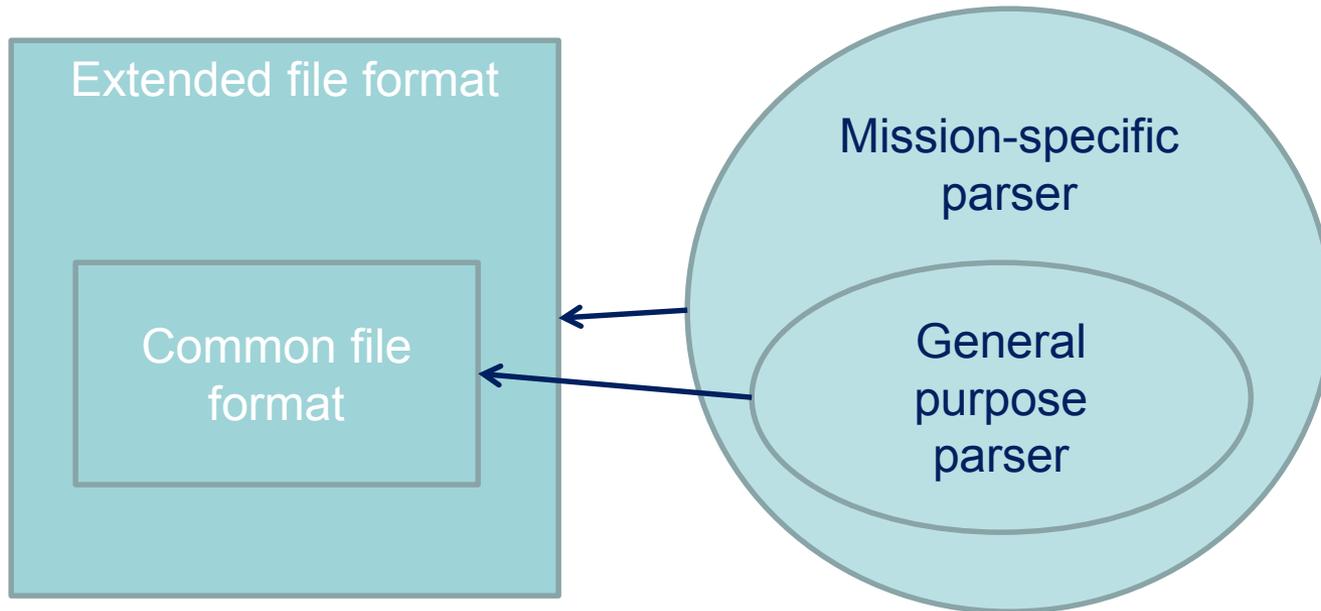


Adaptation

- Adaption required for each mission
 - Common capability is provided to all missions
 - Mission-specific capability can be added to satisfy individual needs
- Adaptation capabilities:
 - Parsed data via file parser extension
 - Captured data via data template
 - Data structure via dataset template
 - Data view via uplink summary and report templates



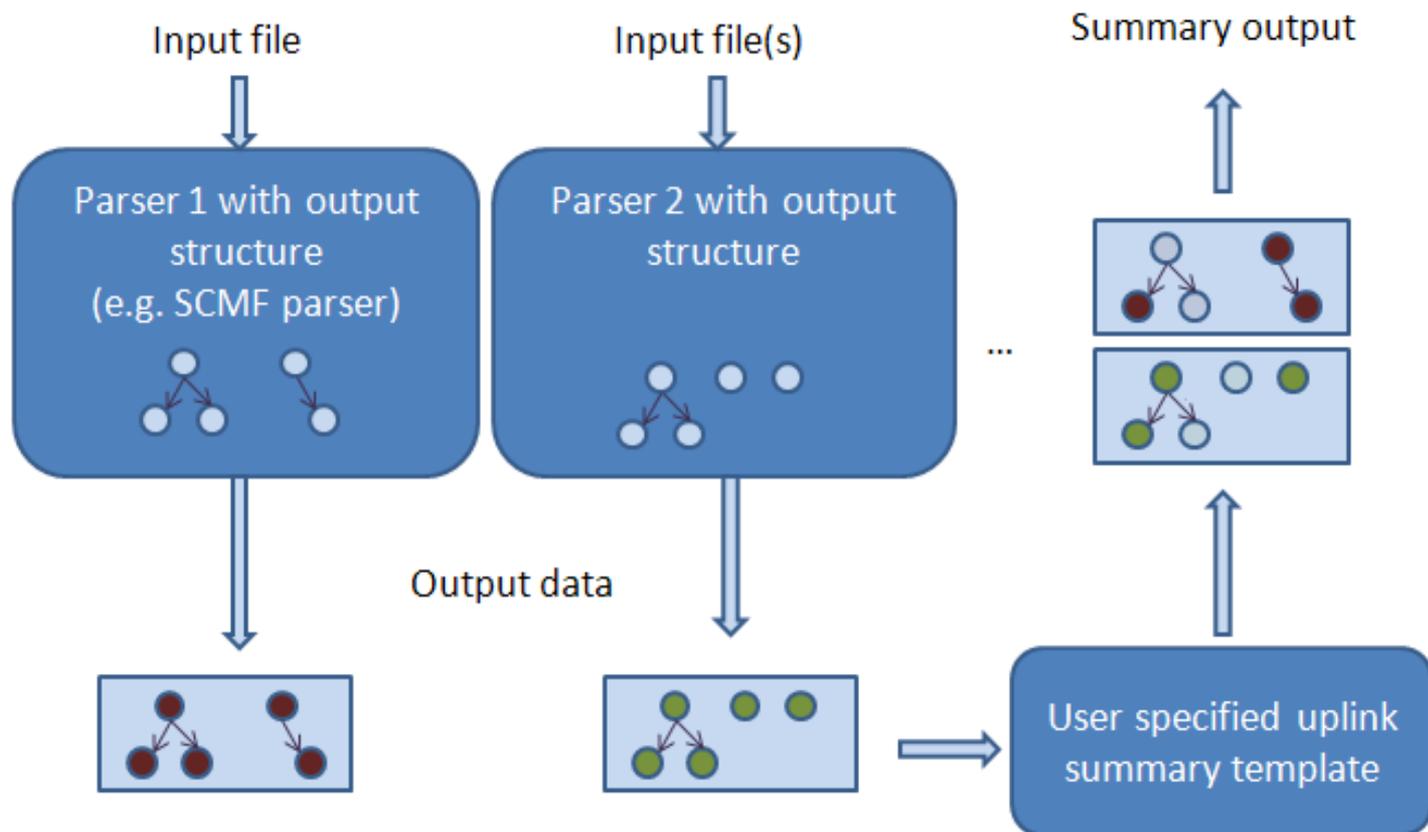
Adaptation (File parser extension)



For example, Mars Science Laboratory (MSL) has bundled sequences in the SCMF file. The common SCMF parser does not generate that information. Therefore, an MSL-specific SCMF parser was derived from the common SCMF parser to generate data with bundled sequences.

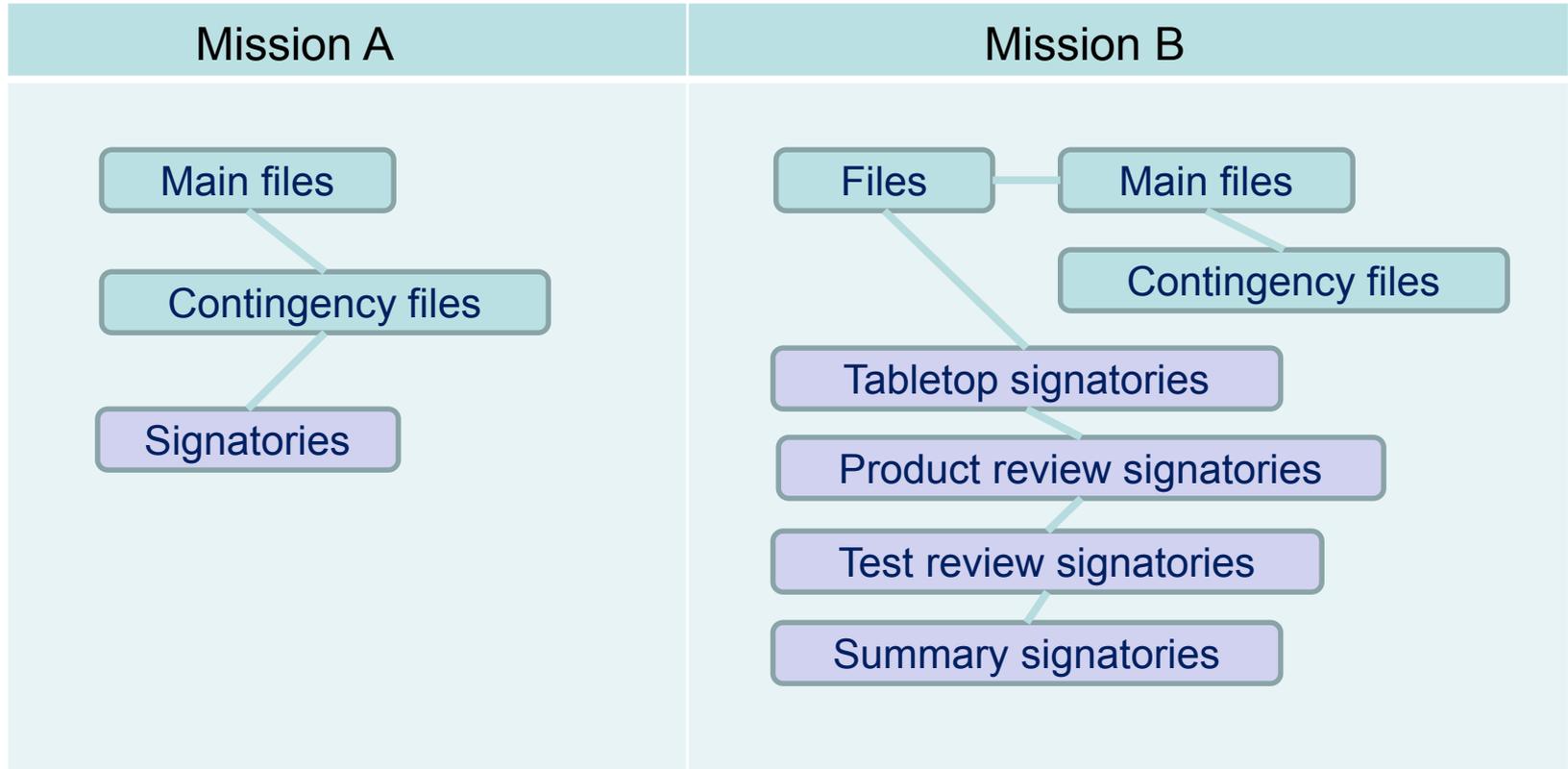


Adaptation (Data template)





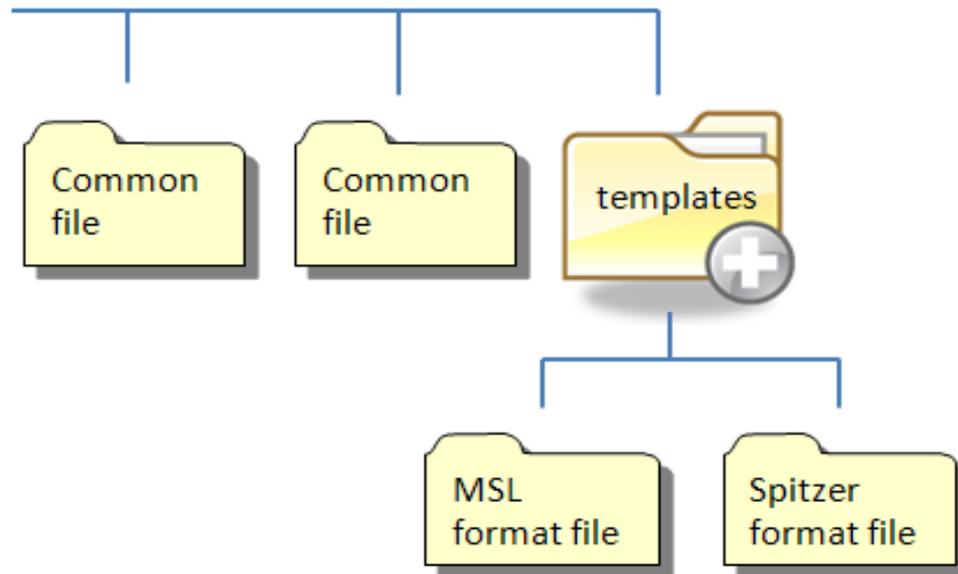
Adaptation (Dataset template)



*Datasets can be dynamically arranged

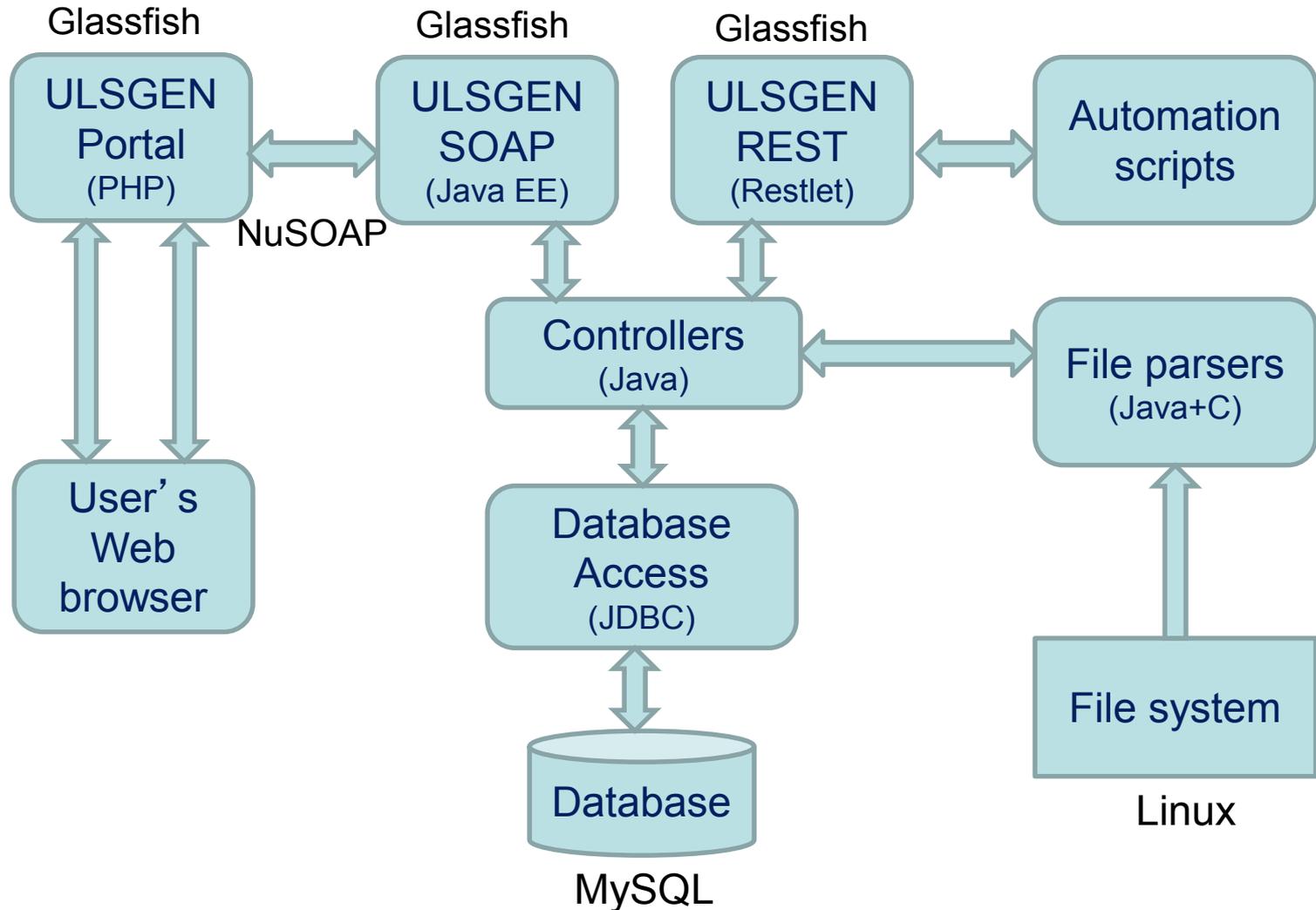


Adaptation (Report template)





ULSGEN Software Architecture





ULSGEN in Operation



Uplink Summary Listing

The screenshot shows a web browser window with the URL 'ULSGEN' and a search bar containing 'Ulsgen_1.5_SMAP'. The page title is 'Uplink Summaries'. Below the title, there are links for 'Configure', 'Permissions', 'Help', and 'Logout'. A control bar includes a link to 'Create new uplink summary', a 'Search' button, and a filter dropdown set to 'None'. The main content is a table with columns for Status, Name, Description, Version, Last modification, Creator, and Metadata. The table contains 20 rows of data with various status values. At the bottom of the table, there is a 'Next 20' link. A footer contains version information and copyright details.

Status	Name	Description	Version	Last modification	Creator	Metadata
GENERATED						Metadata
GENERATED						Metadata
CREATED						Metadata
CREATED						Metadata
PENDING						Metadata
DEPRECATED						Metadata
DEPRECATED						Metadata
PENDING						Metadata
APPROVED						Metadata
GENERATED						Metadata
GENERATED						Metadata
GENERATED						Metadata
APPROVED						Metadata
GENERATED						Metadata
GENERATED						Metadata
OBSELETE						Metadata
OBSELETE						Metadata
GENERATED						Metadata
GENERATED						Metadata
APPROVED						Metadata

[Next 20](#)

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Generate an Uplink Summary

Uplink Summary Configuration

Summary Template
SMAP-Template

Data Sets

SCMP/FILE LOAD/SAS

Main Files			
	Files	Dataset	In Radlist
<input type="checkbox"/>	1		<input checked="" type="checkbox"/>
<input type="checkbox"/>	2		<input type="checkbox"/>
<input type="checkbox"/>	3		<input type="checkbox"/>

Contingency Files

Contingency Files			
	Files	Dataset	In Radlist
<input type="checkbox"/>	1		<input type="checkbox"/>
<input type="checkbox"/>	2		<input type="checkbox"/>

Tabletop

Tabletop			
PARALLEL	Included	Team	User/Group
<input checked="" type="checkbox"/>		TESTER	
<input checked="" type="checkbox"/>		SEQ	

*** Notification recipients: Approval to Signers and Denial to Owner

Product review

Product review			
PARALLEL	Included	Team	User/Group
<input checked="" type="checkbox"/>		TESTER	

*** Notification recipients: Approval to Signers and Denial to Owner

Test review

Test review			
PARALLEL	Included	Team	User/Group
<input checked="" type="checkbox"/>		TESTER	

*** Notification recipients: Approval to Signers and Denial to Owner

Signatories

Signatories			
PARALLEL	Included	Team	User/Group
<input checked="" type="checkbox"/>		TESTER	
<input checked="" type="checkbox"/>		GROUP	

*** Notification recipients: Approval to Signers and Denial to Owner

Uplink Window Files

File	Remove	Add
	Remove	Add

Generate summary data

Save RadList scope

Uplink summary configuration:

1. Data template for uplink file
2. Dataset structure
3. Uplink files and order
4. Signatories
5. Notifications to whom and when
6. Uplink window file



Edit Uplink Summary

Firefox

ULSGEN

https://ulsgendev.jpl.nasa.gov:5081/ULSGenWebClient/uss_summary_data.php?ussId=36b0a135-84bf

MAIN FILES

#	SCHF Name	L/L WINDOWS	Create Time & Checksum	L/L BCR (hh:mm:ss)	L/L Rate	XMET Coverage	SASF	CRC	V C B	V C B	SYS
1		2012-080703 08:56 - 2012-080703 09:12 2012-000703 28:56 - 2012-000703 29:12	2011-031717-01:01:00 0x0000	00:00:57	20000 0	<input checked="" type="checkbox"/>	5aw18353	020803	0	0	0
2			2011-080722 08:14:00 0x0000	00:00:01	20000 0	<input checked="" type="checkbox"/>			0	0	0
3			2011-080722 18:49:00 0x0000	00:00:01	20000 0	<input checked="" type="checkbox"/>			0	0	0

CONTINGENCY FILES

#	SCHF Name	L/L WINDOWS	Create Time & Checksum	L/L BCR (hh:mm:ss)	L/L Rate	XMET Coverage	SASF	CRC	V C B	V C B	SYS
4			2011-080722 18:49:00 0x0000	00:00:01	20000 0	<input checked="" type="checkbox"/>			0	0	0
5			2011-081718 08:02:00 0x0000	00:00:01	20000 0	<input checked="" type="checkbox"/>			0	0	0

SYSTEM COMMENTS

REVIEW FILE #10

FLIGHT FILE VIOLATIONS (NUMBER NO. AND/OR DESCRIPTION)

TABLETOP (OPTIONAL) **TABLETOP DATE FIELD**

Status	Team	Required user group	Signed by	Comment
<input checked="" type="checkbox"/>	TESTER			
<input checked="" type="checkbox"/>	SRQ			

PRODUCT REVIEW APPROVALS **PRODUCT REVIEW DATE**

Status	Team	Required user group	Signed by	Comment
<input checked="" type="checkbox"/>	TESTER			

TEXT REVIEW APPROVALS **ITL TEST** **WSTS TEST** **TEXT ENGINEER**

Status	Team	Required user group	Signed by	Comment
<input checked="" type="checkbox"/>	TESTER			

TEST COMMENTS (INCLUDE TEST ID)

SIGNATURES

Status	Team	Required user group	Signed by	Comment
<input checked="" type="checkbox"/>	TESTER			
<input checked="" type="checkbox"/>	CRCLP			

ADDITIONAL COMMENTS

Edit a generated uplink summary to create a minor version

Configurability of overwritten fields



Signature Cycle

The screenshot shows the ULSGEN web application interface. At the top, there is a navigation bar with the ULSGEN logo and a breadcrumb trail: Workspaces >> UlsGen_1_5_SMAP >> Test82. Below the breadcrumb, there are links for General Info, Metadata, Edit Summary Data, Signatures, Show Report, Help, and Logout. The main content area is titled "Signature Information for Version 1.0" and includes a note: "(Do not use browser to refresh this page. Click 'Signatures' in breadcrumb to refresh.)".

The interface displays four tables, each with a "Restart signature cycle" button:

- Tabletop (Notified)**: A table with 8 columns: Team, Required user/group, Status, Version, Signed by, Comment, Action time, and Action. It contains two rows: TESTER and SEQ, both with a "Sign" button in the Action column.
- Product review (Approved)**: A table with 8 columns: Team, Required user/group, Status, Version, Signed by, Comment, Action time, and Action. It contains one row: TESTER, with an "Action" column.
- Test review (Denied)**: A table with 8 columns: Team, Required user/group, Status, Version, Signed by, Comment, Action time, and Action. It contains one row: TESTER, with a "Sign" button in the Action column.
- Signatures**: A table with 8 columns: Team, Required user/group, Status, Version, Signed by, Comment, Action time, and Action. It contains two rows: TESTER and GROUP, both with an "Action" column.

Below the tables, there is a "View RadList" button and a status message: "Signature cycle started: Tabletop".

At the bottom of the page, there is a footer with copyright information: "Version Info (c) 2011-2014. California Institute of Technology. ALL RIGHTS RESERVED. U.S. Government sponsorship acknowledged. Any commercial use must be negotiated with the Office of Technology Transfer at the California Institute of Technology. The technical data in this document is controlled under the U.S. Export Regulations, release to foreign persons may require an export authorization."

Signers receive emails based on the options selected during configuration



Uplink Summary

Firefox

ULSGEN x ULS Gen

ULSGEN

SMAP SCID: 205

Uplink Summary Form

NAME: MCR/COR/SCR =
DESCRIPTION: DATE STARTED:
STATUS:
REVISION DATE: 2014-04-04T09:19:00-07:00
VERSION: 1.0

SYSTEMS COORDINATOR:

SCMF FILE LOAD SASP:

MAIN FILES												
#	SCMF Name	UL WINDOWS	Creation Time & Checksum	U/L DUR (hh:mm:ss)	U/L Rate	XMT Constrains	SASF	CRC	V	V	V	SYS
1			2011-091711-21:21:00 0a06b	00:00:27	2000.0		twst6583	c204902a	0	1	0	
2			2011-091722-48:14:00 0a2a94	00:00:01	2000.0				0	1	0	
3			2011-091721-28:49:00 0a12c1	00:00:01	2000.0				0	1	0	

CONTINGENCY FILES												
#	SCMF Name	UL WINDOWS	Creation Time & Checksum	U/L DUR (hh:mm:ss)	U/L Rate	XMT Constrains	SASF	CRC	V	V	V	SYS
1		f	2011-091721-28:49:00 0a0710	00:00:01	2000.0				0	1	0	
2		f	2011-101716-48:02:00 0a06a0	00:00:01	2000.0				0	1	0	

SYSTEM COMMENTS REVIEW DUE BY:

FLIGHT RULE VIOLATIONS (WAIVER NO. AND/OR DESCRIPTION)

TABLETOP (OPTIONAL): TABLETOP DATE HELD:

Status	Team	Required user/group	Signed by	Comment
<input checked="" type="checkbox"/> Notified	TESTER			
<input checked="" type="checkbox"/> Notified	SEQ	op		

PRODUCT REVIEW APPROVALS PRODUCT REVIEW DATE:

Status	Team	Required user/group	Signed by	Comment
<input checked="" type="checkbox"/> Approval	TESTER			

TEST REVIEW APPROVALS IFL TEST? WSTS TEST? TEST ENGINEER:

Status	Team	Required user/group	Signed by	Comment
<input checked="" type="checkbox"/> Denied	TESTER		Incorrect	

TEST COMMENTS (INCLUDE TEST ID)

SIGNATURES

Status	Team	Required user/group	Signed by	Comment
<input checked="" type="checkbox"/> None	TESTER			
<input checked="" type="checkbox"/> None	GROUP			

ADDITIONAL COMMENTS

Uplink summary can be saved to a PDF file

Other reports such as RadList can be generated

REST web services are provided for easy automation



Conclusion

- ULSGEN provides both uplink summary generation and signature cycle capabilities.
- Adaptation provides flexibility in a multi-mission environment.
- ULSGEN improves the efficiency of uplink review process.
- ULSGEN reduces the risk of human errors.