

Introduction to EMF Server Communication and Cases

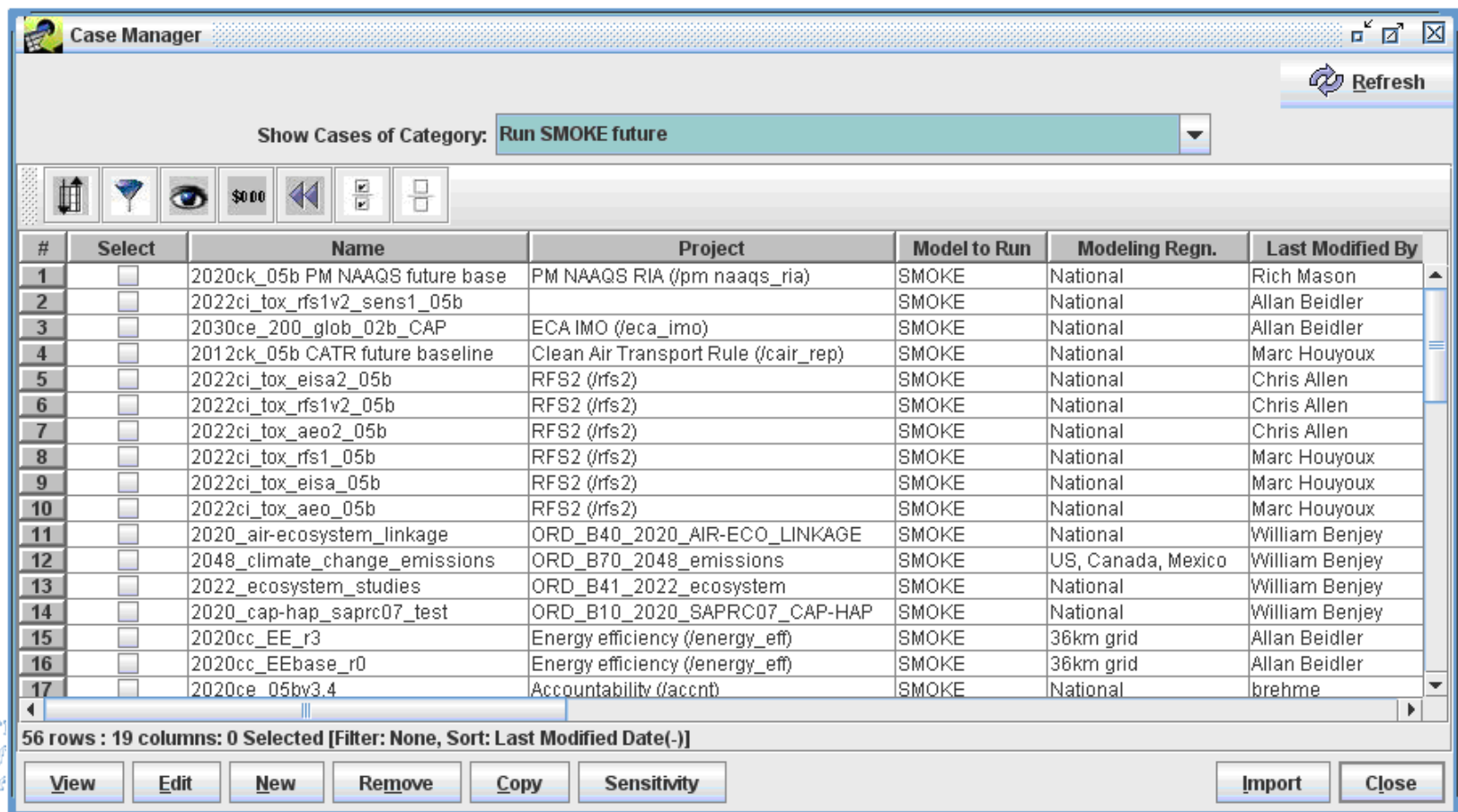
Beta Testing



November 4, 2009

EMF Case Manager

- The Case Manager uses SMOKE programs to create emissions modeling outputs.
- Case: Set of Jobs, Inputs, and Parameters that fully describe a SMOKE or other model run



#	Select	Name	Project	Model to Run	Modeling Regn.	Last Modified By
1	<input type="checkbox"/>	2020ck_05b PM NAAQS future base	PM NAAQS RIA (/pm naaqs_ria)	SMOKE	National	Rich Mason
2	<input type="checkbox"/>	2022ci_tox_rfs1v2_sens1_05b		SMOKE	National	Allan Beidler
3	<input type="checkbox"/>	2030ce_200_glob_02b_CAP	ECA IMO (/eca_imo)	SMOKE	National	Allan Beidler
4	<input type="checkbox"/>	2012ck_05b CATR future baseline	Clean Air Transport Rule (/cair_rep)	SMOKE	National	Marc Houyoux
5	<input type="checkbox"/>	2022ci_tox_eisa2_05b	RFS2 (/rfs2)	SMOKE	National	Chris Allen
6	<input type="checkbox"/>	2022ci_tox_rfs1v2_05b	RFS2 (/rfs2)	SMOKE	National	Chris Allen
7	<input type="checkbox"/>	2022ci_tox_aeo2_05b	RFS2 (/rfs2)	SMOKE	National	Chris Allen
8	<input type="checkbox"/>	2022ci_tox_rfs1_05b	RFS2 (/rfs2)	SMOKE	National	Marc Houyoux
9	<input type="checkbox"/>	2022ci_tox_eisa_05b	RFS2 (/rfs2)	SMOKE	National	Marc Houyoux
10	<input type="checkbox"/>	2022ci_tox_aeo_05b	RFS2 (/rfs2)	SMOKE	National	Marc Houyoux
11	<input type="checkbox"/>	2020_air-ecosystem_linkage	ORD_B40_2020_AIR-ECO_LINKAGE	SMOKE	National	William Benjey
12	<input type="checkbox"/>	2048_climate_change_emissions	ORD_B70_2048_emissions	SMOKE	US, Canada, Mexico	William Benjey
13	<input type="checkbox"/>	2022_ecosystem_studies	ORD_B41_2022_ecosystem	SMOKE	National	William Benjey
14	<input type="checkbox"/>	2020_cap-hap_saprc07_test	ORD_B10_2020_SAPRC07_CAP-HAP	SMOKE	National	William Benjey
15	<input type="checkbox"/>	2020cc_EE_r3	Energy efficiency (/energy_eff)	SMOKE	36km grid	Allan Beidler
16	<input type="checkbox"/>	2020cc_EEbase_r0	Energy efficiency (/energy_eff)	SMOKE	36km grid	Allan Beidler
17	<input type="checkbox"/>	2020ce_05bv3.4	Accountability (/accnt)	SMOKE	National	brehme

56 rows : 19 columns: 0 Selected [Filter: None, Sort: Last Modified Date(-)]

View Edit New Remove Copy Sensitivity Import Close

EMF Cases – Summary tab

Case Editor: 2002ce_02b_CAP-CI

Summary Jobs Inputs Parameters Outputs History

Name: 2002ce_02b_CAP-CI Abbreviation: 2002ce_02b

Category: **Sector: Emissions modeling sector(e.g., ptipm, ptnonipm)** ☐ Is Template

Description: afdust ag alm_no_c3

Project: 2002-based platform, v3.1 Copied From: 2002ae_02b_CAP-CI

Run Status: Failed Last Modified By: Rich Mason on 06/16/2008 16:04

Model & Version: SMOKE 2.4 Downstream Model: CMAQ v4.6.2i

Modeling Region: National Speciation: cmaq_cb05

Regions:

Met/Emis Layers: 14 10 Meteorological Year: 2002

Base Year: 2002

Future Year: 2002

Start Date & Time: 01/01/2002 00:00 End Date & Time: 12/31/2002 23:59



EMF Cases – Jobs tab

Job: Program or script with settings and arguments

The screenshot shows the 'Case Editor' interface with the 'Jobs' tab selected. A red box highlights the title 'Job: Program or script with settings and arguments'. The main window displays a list of jobs with columns for '#', 'Select', 'Name', and 'Order'. The 'Name' column lists various jobs, including 'Annual seca_c3 onetime 1...' and 'Monthly nonroad Q1 Jan-F...'. A red circle highlights the 'Executable' field in the job details, which contains the path 'SMK_HOME/subsys/smoke24/scripts/emf/smk_pt_annual_byday_emf.csh'. Another red circle highlights the 'Host' field, which is set to 'amber.nescepa.gov'. The 'Run Status' is 'Not Started'. The 'Queue Options' are 'qsub -o \$EMF_JOBLOG \$EMF...'. The 'Parent case ID' is '0' and the 'Local' checkbox is checked. The 'User' is 'Chris Allen'. The 'Run Results' section shows 'Queue ID: 25726.amber', 'Date Started:', 'Date Completed:', and 'Job Notes:'. The 'Last Message:' field is also visible. The bottom of the window has buttons for 'Add', 'Remove', 'Edit', 'Copy', 'Modify', 'Run', 'Val', 'Refresh', 'Load', 'Export', 'Save', 'view Parent', 'view Related', and 'Close'.

#	Select	Name	Order
31	<input type="checkbox"/>	Annual seca_c3 onetime 1...	
32	<input type="checkbox"/>	Annual seca_c3 onetime 1...	
33	<input type="checkbox"/>	Annual seca_c3 onetime 3...	
34	<input type="checkbox"/>	Annual seca_c3 Q1 Jan-Fe...	
35	<input type="checkbox"/>	Annual seca_c3 Q1 Jan-Fe...	
36	<input type="checkbox"/>	Annual seca_c3 Q1 Jan-Fe...	
37	<input type="checkbox"/>	Annual seca_c3 Q2 Apr-M...	
38	<input type="checkbox"/>	Annual seca_c3 Q2 Apr-M...	
39	<input type="checkbox"/>	Annual seca_c3 Q2 Apr-M...	
40	<input type="checkbox"/>	Annual seca_c3 Q3 Jul-Au...	
41	<input type="checkbox"/>	Annual seca_c3 Q3 Jul-Au...	
42	<input type="checkbox"/>	Annual seca_c3 Q3 Jul-Au...	
43	<input type="checkbox"/>	Annual seca_c3 Q4 Oct-No...	
44	<input type="checkbox"/>	Annual seca_c3 Q4 Oct-No...	
45	<input type="checkbox"/>	Annual seca_c3 Q4 Oct-No...	
46	<input type="checkbox"/>	Monthly nonroad Q1 Jan-F...	
47	<input type="checkbox"/>	Monthly nonroad Q1 Jan-F...	
48	<input type="checkbox"/>	Monthly nonroad Q1 Jan-F...	
49	<input type="checkbox"/>	Monthly nonroad Q2 Apr-	

99 rows : 23 columns: 0 Selected [Filter: None, Sort: ...]

Job Details:

- Name: Annual ptnonipm Q1 Jan-Feb-Mar 36US1
- Purpose: Run ptnonipm sector Temporal, temporal QA, Laypoint, Smkmerge, and m3stat for January through March, 36km domain
- Executable: SMK_HOME/subsys/smoke24/scripts/emf/smk_pt_annual_byday_emf.csh
- Setup:
 - Version: 0
 - Arguments: \$GRID_1 \$IOAPI_GRIDNAME_1
 - Job Order: 0.1
 - Job Group:
 - Queue Options: qsub -o \$EMF_JOBLOG \$EMF...
 - Parent case ID: 0 ☒ Local
 - User: Chris Allen
- Region: [Dropdown]
- Sector: ptnonipm
- Host: amber.nescepa.gov
- Run Status: Not Started
- Run Results:
 - Queue ID: 25726.amber
 - Date Started:
 - Date Completed:
 - Job Notes:
 - Last Message:

Buttons: Add, Remove, Edit, Copy, Modify, Run, Val, Refresh, Load, Export, Save, view Parent, view Related, Close

EMF Cases – Inputs tab

Input: Dataset used by one or more Jobs

Case Editor: 2002ce_02b_CAP-CI

Summary Jobs **Inputs** Parameters Outputs History

Input Folder: /orchid/share/em_v31/inputs/2002ce_02b Browse

Sector: All Environment Variable Contains:

☐ ☐ ☐ ☐ ☐ ☐ ☐

#	Select	Input	Env. Var.	Region	Sector	Job
22	<input type="checkbox"/>	Biogenic gridding surrogate for reports 12WUS1	BGPRO		beis	Annual beis3 12WUS1
23	<input type="checkbox"/>	Biogenic gridding surrogate for reports 36US1	BGPRO		beis	Annual beis3 36US1
24	<input type="checkbox"/>	Bioseasons file 12EUS1	BIOSEASON		beis	Annual beis3 12EUS1
25	<input type="checkbox"/>	Bioseasons file 12WUS1	BIOSEASON		beis	Annual beis3 12WUS1
26	<input type="checkbox"/>	Bioseasons file 36US1	BIOSEASON		beis	Annual beis3 36US1
27	<input type="checkbox"/>	Country, State, County Information	COSTCY		All sectors	All jobs for sector
28	<input type="checkbox"/>	emf job header	EMF_JOBHEA...		All sectors	All jobs for sector
29	<input type="checkbox"/>	Inventory ptipm daily data (nonCEM sources)	EMISDAY_MU...		ptipm	All jobs for sector
30	<input type="checkbox"/>	Inventory ptipm daily data (CEM sources)	EMISDAY_MU...		ptipm	All jobs for sector
31	<input type="checkbox"/>	Inventory afdust CAP	EMISINV		afdust	All jobs for sector
32	<input type="checkbox"/>	Inventory ag CAP	EMISINV		ag	All jobs for sector
33	<input type="checkbox"/>	Inventory avefire CAP	EMISINV		avefire	All jobs for sector
34	<input type="checkbox"/>	Inventory seca_c3 CAP	EMISINV		seca_c3	All jobs for sector
35	<input type="checkbox"/>	Inventory nonroad US, not Calif CAP January	EMISINV_01A		nonroad	All jobs for sector
36	<input type="checkbox"/>	Inventory onroad US, not Calif CAP January	EMISINV_01A		onroad	All jobs for sector
37	<input type="checkbox"/>	Inventory nonroad Calif CAP 01 January	EMISINV_01B		nonroad	All jobs for sector
38	<input type="checkbox"/>	Inventory onroad Calif CAP 01 January	EMISINV_01B		onroad	All jobs for sector

179 rows : 15 columns: 0 Selected [Filter: None, Sort: Env. Var.(+), Sector(+), Input(+), Job(+)]

Add Remove Edit Copy View Dataset Export Inputs Find ☐ Show All

Refresh Load Export Save View Parent View Related Close



EMF Cases – Parameters tab

Parameter: Setting, usually an environment variable, used by one or more Jobs

Case Editor: 2002ce_02b_CAP-CI

Summary Jobs Inputs **Parameters** Outputs H

Sector: **ptipm** Environment Variable Contains:

#	Select	Parameter	Order	Env. Var.	Region	Sector	
1	<input type="checkbox"/>	PTDAY file name case	1.10	DAILY_CASE		ptipm	All jobs for s
2	<input type="checkbox"/>	Don't use day-specific emission	3.00	DAY_SPECIFIC_YN		ptipm	Annual ptipm
3	<input type="checkbox"/>	Use day-specific emission	3.00	DAY_SPECIFIC_YN		ptipm	All jobs for s
4	<input type="checkbox"/>	Don't use hour-specific emission	3.00	HOURLY_SPECIFIC_YN		ptipm	All jobs for s
5	<input type="checkbox"/>	Prefix for PTHOUR file names	3.00	HOURLY_PREFIX		ptipm	All jobs for s
6	<input type="checkbox"/>	Temporal type	3.00	L_TYPE		ptipm	All jobs for s
7	<input type="checkbox"/>	Merge type	3.00	M_TYPE		ptipm	All jobs for s
8	<input type="checkbox"/>	Count of underscores for Daily data prefix	3.00	NAMEBREAK_DAILY		ptipm	All jobs for s
9	<input type="checkbox"/>	Check for duplicate sources	3.00	RAW_DUP_CHECK		ptipm	All jobs for s
10	<input type="checkbox"/>	Write zero emissions	3.00	WRITE_ANN_ZERO		ptipm	All jobs for s

10 rows : 15 columns: 0 Selected [Filter: None, Sort: Order(+), Env. Var.(+), Sector(+), Parameter(+), Job(+)]

Add Remove Edit Copy ☐ Show All

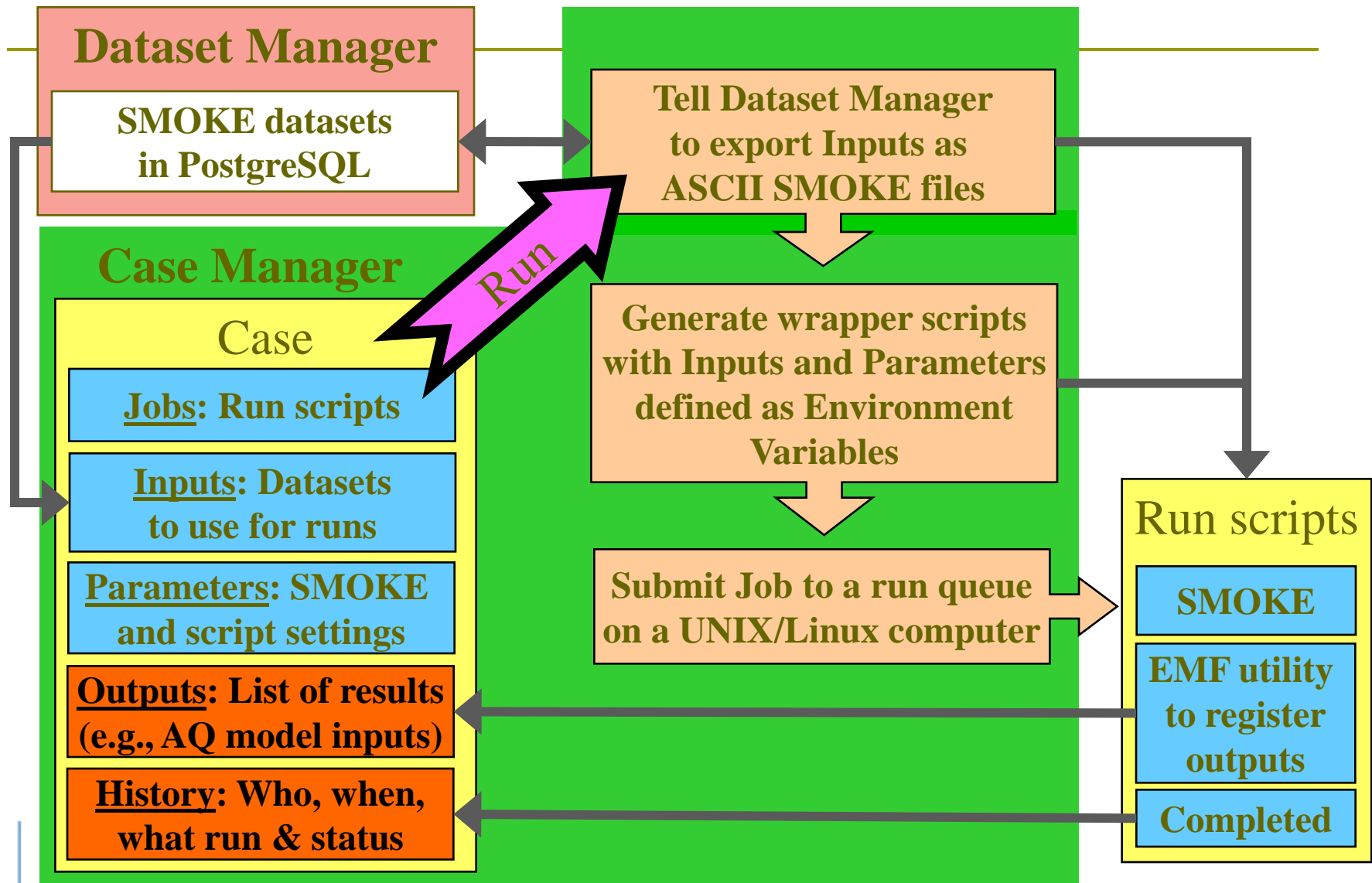
Refresh Load Export Save View Parent View Related Close

Key EMF Definitions

- ❑ Case: Set of Jobs, Inputs, and Parameters that fully describe a SMOKE run
- ❑ Job: Program or script with settings and arguments needed to run a script
- ❑ Input: Dataset used by one or more Jobs
- ❑ Parameter: Setting, usually an environment variable, used by one or more Jobs



Case Management Overview



Running a Job in EMF

- ❑ User selects job(s) and clicks run (EMF client)
- ❑ EMF exports inputs (EMF server)
- ❑ EMF writes a job wrapper script (EMF server)
 - EMF wrapper scripts are specific for a CASE and JOB and specific run (date-stamped)
 - Include all inputs and parameters needed by that job
 - EMF wrapper scripts call model specific scripts (e.g., SMOKE sector specific script)



Running a Job in EMF (2)

- ❑ EMF submits job to the SMOKE server
 - After exports are completed and dependencies are satisfied
- ❑ Job executable runs (SMOKE server)
 - SMOKE scripts and ASSIGNS file have been modified to be more generic
 - SMOKE scripts communicate status, message and imports files via EMF command-line client



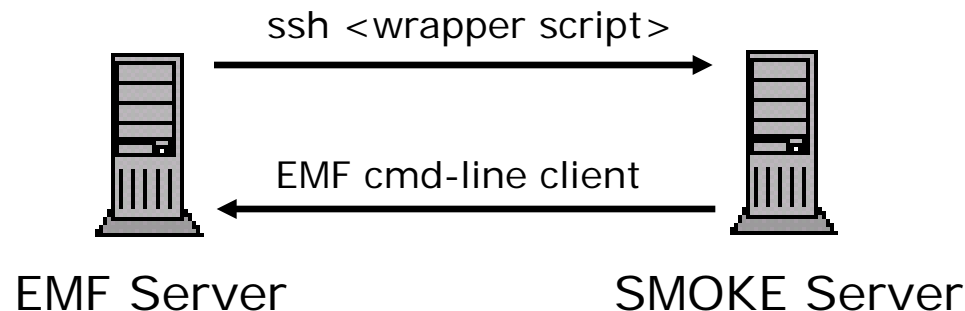
Communication between Servers

□ EMF to SMOKE server:

- EMF uses ssh-keys to start running programs on SMOKE server and for authentication
- On EMF server the Linux user “emf” ssh into SMOKE server as the SMOKE user and starts the EMF wrapper script

□ SMOKE to EMF server:

- SMOKE scripts call EMF command-line client
- Communicate changes in status, messages, or imports outputs generated by SMOKE



Delivered Cases

1. Test messages and imports
2. Spatial Surrogate
3. 2005 SMOKE platform

Each delivery will include:

- Case to import into EMF
- Executable scripts
- Potentially one or more datasets to import into EMF

