Instrumentation and Measurement

Uses Cases for Experimenters

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Instrumentation and Measurement Use Cases for Experimenters

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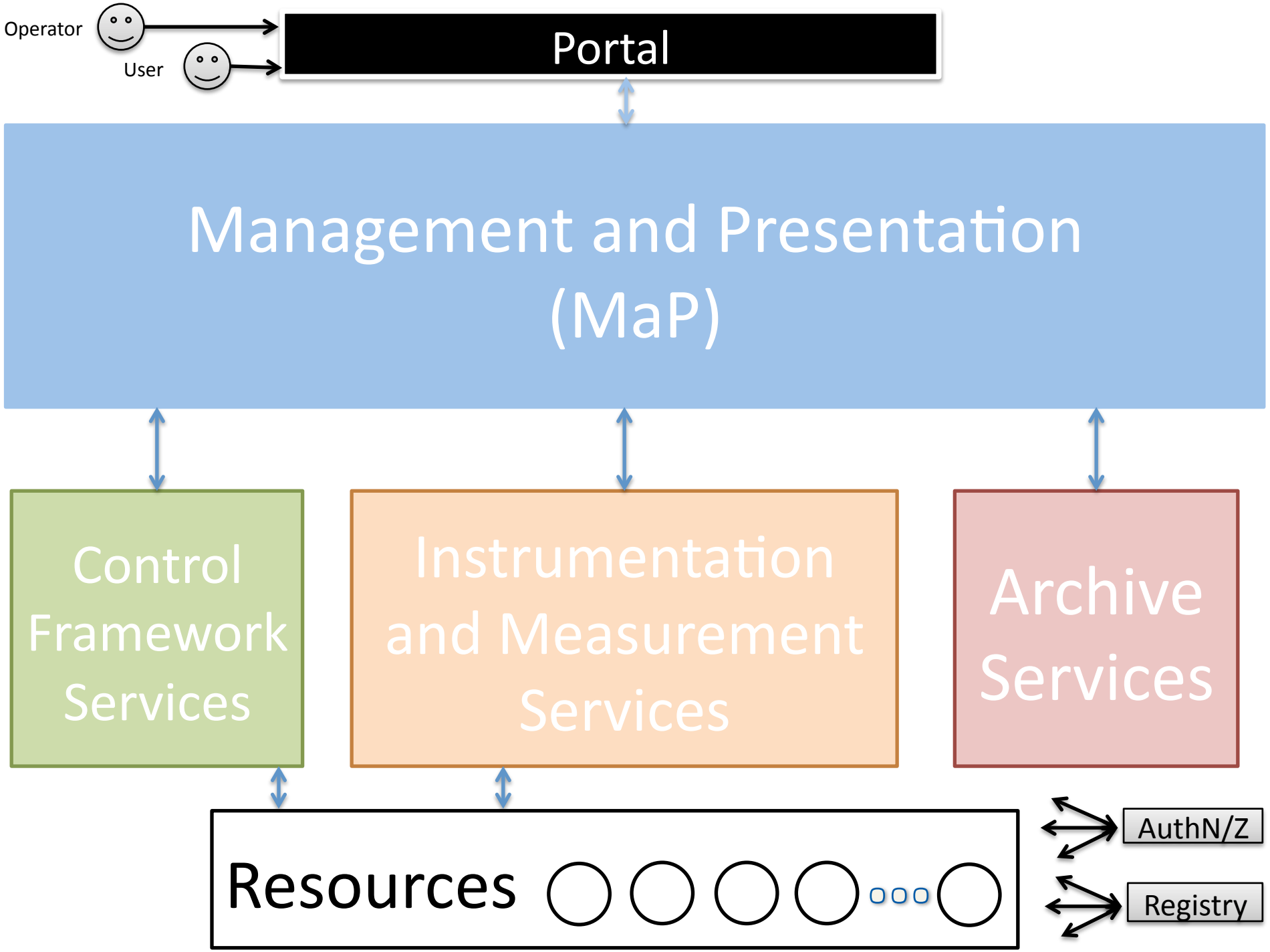
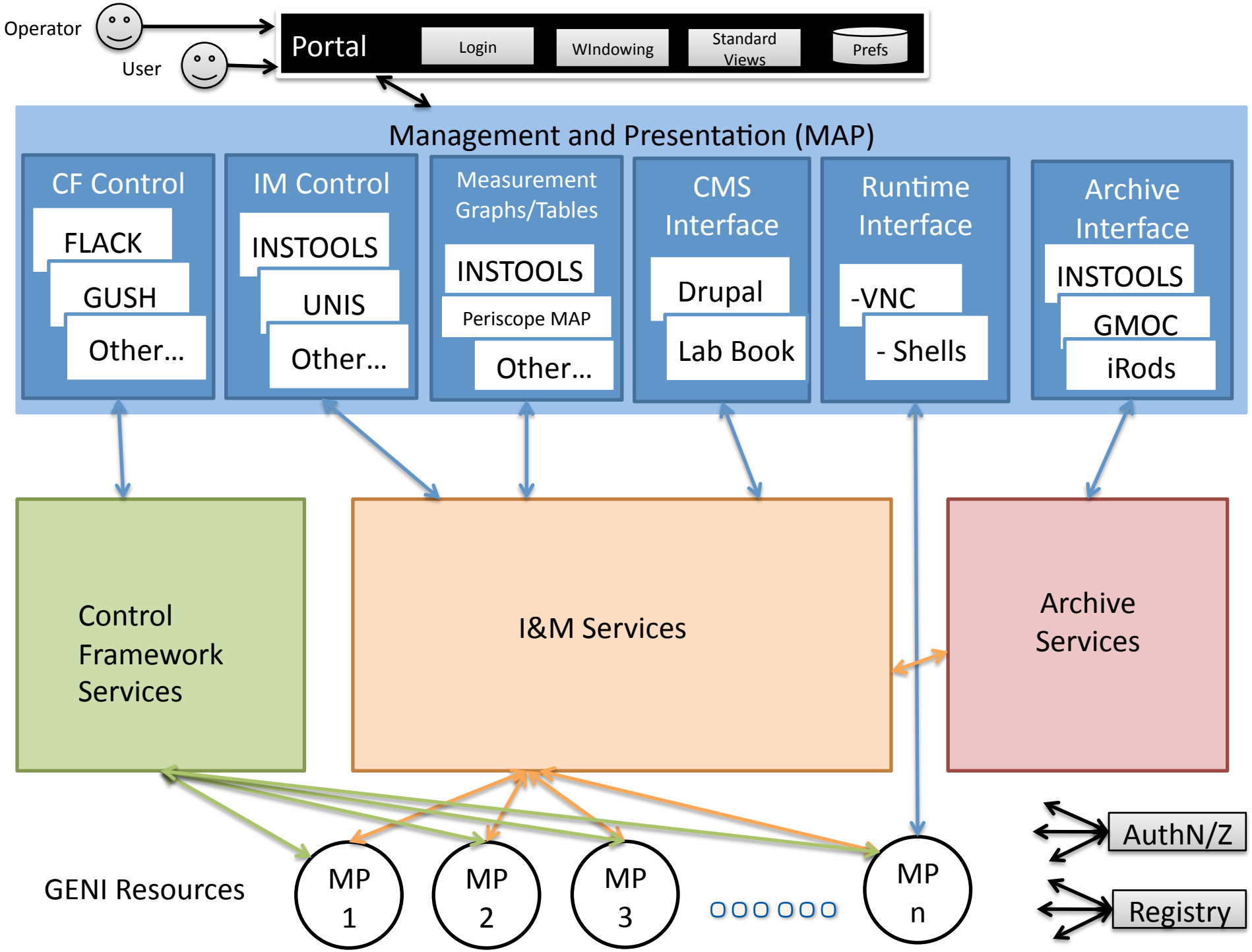
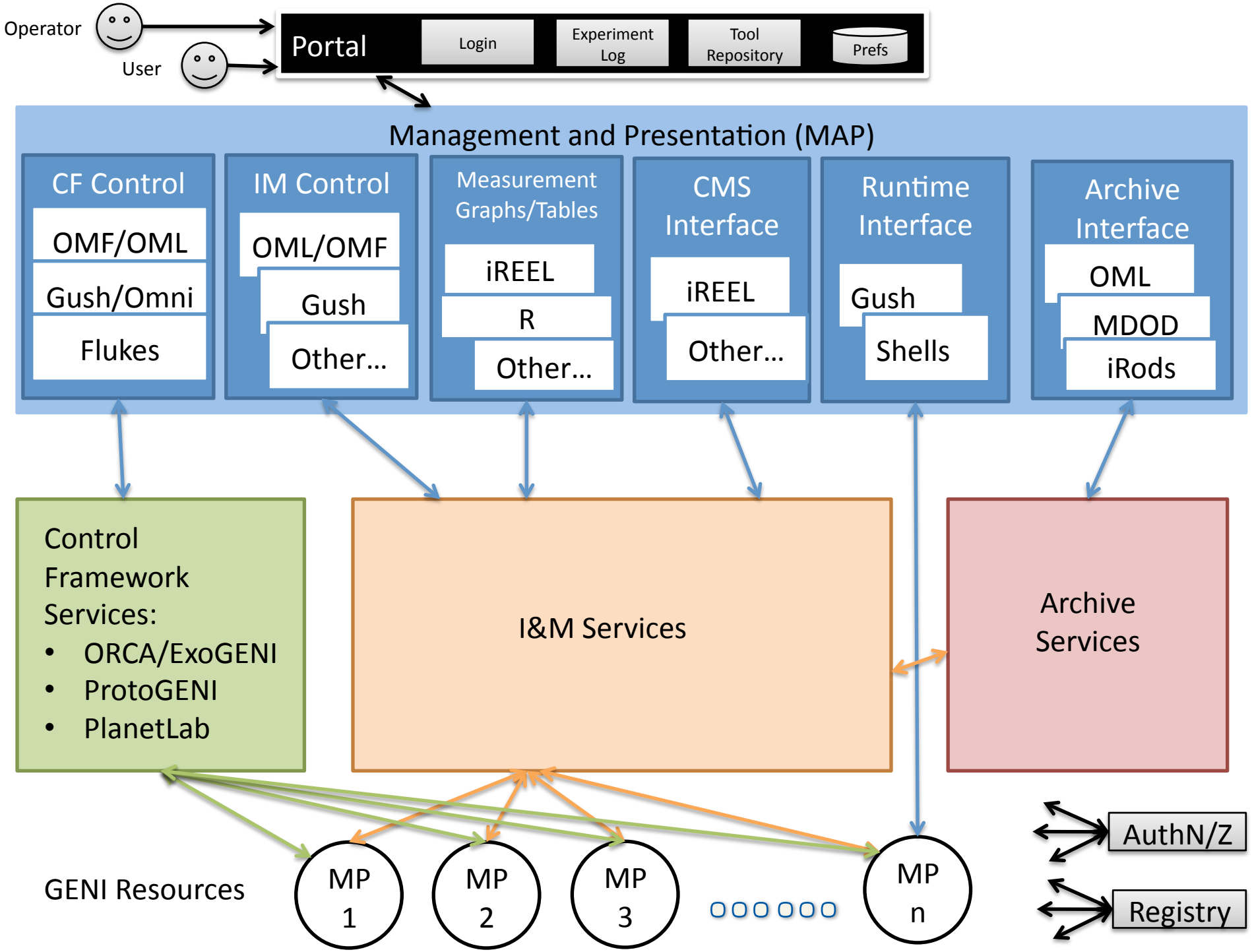
  - Max Ott
  - Prasad Calyam
  - Harry Mussman
- Goal:
  - Define use cases for a wide range of experiments: complex (by skilled experimenters) to simple (by novice experimenter, i.e., a student)
- Design Decision:
  - Users will interact with all aspects of GENI through a *GENI Portal*


Operator
User
Portal
Management and Presentation (MaP)
Control Framework Services
Instrumentation and Measurement Services
Archive Services
Resources
AuthN/Z
Registry


Operator
User
Portal
Login
WIndowing
Standard Views
Prefs
Management and Presentation (MAP)
CF Control
FLACK
GUSH
Other…
IM Control
INSTOOLS
UNIS
Other…
Measurement Graphs/Tables
INSTOOLS
Periscope MAP
Other…
CMS Interface
Drupal
Lab Book
Runtime Interface
-VNC
- Shells
Archive Interface
INSTOOLS
GMOC
iRods
Control Framework Services
I&M Services
Archive Services
GENI Resources
MP 1
MP 2
MP 3
MP n
AuthN/Z
Registry


Operator
User
Portal
Login
Experiment Log
Tool Repository
Prefs
Management and Presentation (MAP)
CF Control
OMF/OML
Gush/Omni
Flukes
IM Control
OML/OMF
Gush
Other…
Measurement Graphs/Tables
iREEL
R
Other…
CMS Interface
iREEL
Other…
Runtime Interface
Gush
Shells
Archive Interface
OML
MDOD
iRods
Control Framework Services:
• ORCA/ExoGENI
• ProtoGENI
• PlanetLab
I&M Services
Archive Services
GENI Resources
MP 1
MP 2
MP 3
MP n
AuthN/Z
Registry

Base Case

1. Setup and run experiment using Experiment Control Tools and Experiment Orchestration Service
   - Include resources and software for instrumentation and measurement services in the slice
2. Setup and run measurement services within slice, using persistent services as necessary.
   - Option: get measurement data from persistent MP.
3. Gather MD into MAP service, to analyze and.or visualize, during or after experiment; formulate MDOD.
4. Archive MD with MDOD.
5. Share archived MD with others, per policy included within MDOD.
6. Pull MD out of archive, to analyze and/or visualize.

- Example: INSTOOLS

Disconnected Case

- **MC may be disconnected from MPs from time to time**
  - Example: WiMAX (or other wireless) experiment

Measurement-driven Case

- **Experiment where measurements may drive other functions in the experiment**
  - Example: adjust protocol parameters based on LEARN/BEN layer 0,1 or 2 measurements

Sensor Case

- **Sensor measurements**
  - Example: radars and power monitors
    Where measurements are at the heart of the experiment

Workflow Case?

- **Workflow measurements**
  - Example: measure DiCloud? workflow

Classifying Use Cases

- Across what dimensions should use cases be defined?
  - Users' skill level (novice to expert)
  - User Role (experimenter, operations)
  - User Goals (researcher, student, service builder)
  - Testbed environment (conventional environment, disconnected environment, mobile environment, etc.) application-level network)
  - Type of application or data (basic measurement data, complex measurement data, sensor measurement data).
  - Type of workflow?