

JFCOM, ISI, USC , MHPCC and ASC-MSRC: Interactive High Performance Computing

Computational Sciences



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Overview



Review Joint Experimentation

Urban Resolve 2015 Phase 2

Interactive Computing in the real World

Issues

Use

Ownership

Security





Joint Experimentation HPCC Requirements



JFCOM needs Larger Scale

Global scale vs. theatre

Experimenters want Higher Fidelity

Greater complexity in models of entities
(sensors, people, vehicles, etc.)

New world problems mandate
Urban Operations

Millions of civilians

How many vehicles in L.A.?

... Baghdad?

All of the above require dramatic
increase in computing power relative
to network of workstations previously
available.



Driven by Joint Advanced Warfighting Project (JAWP)

Large urban battle space

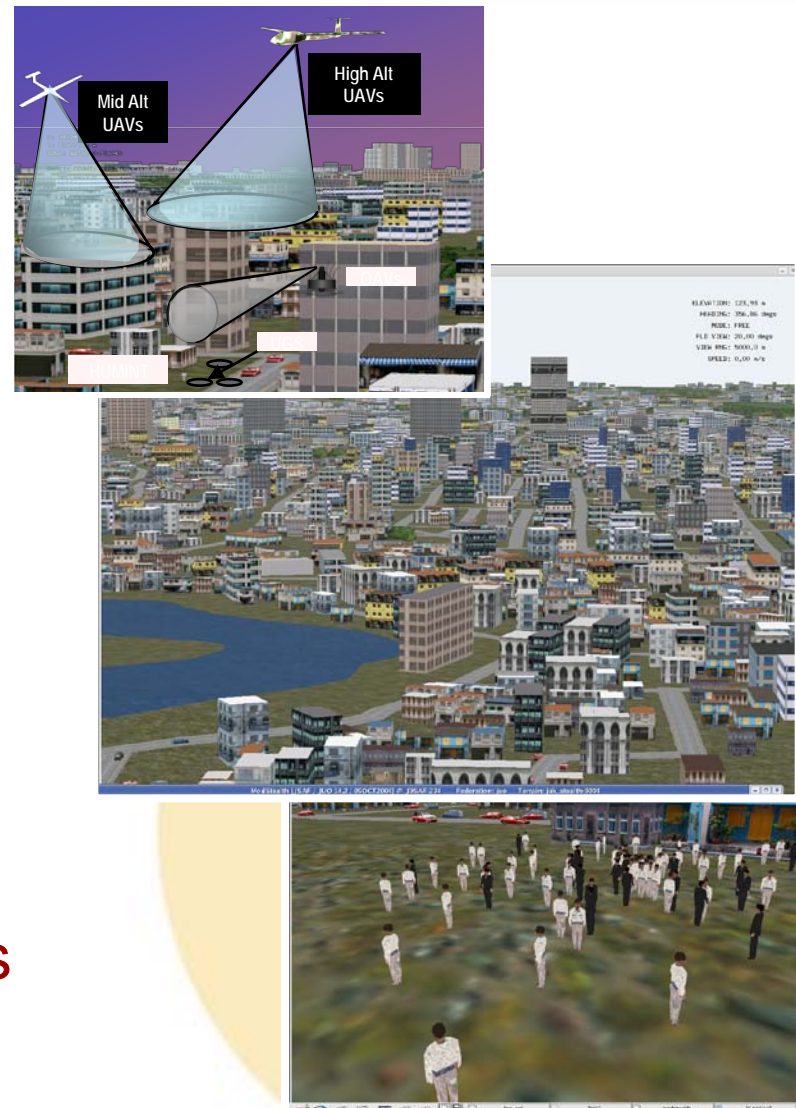
100-200K entities (current)

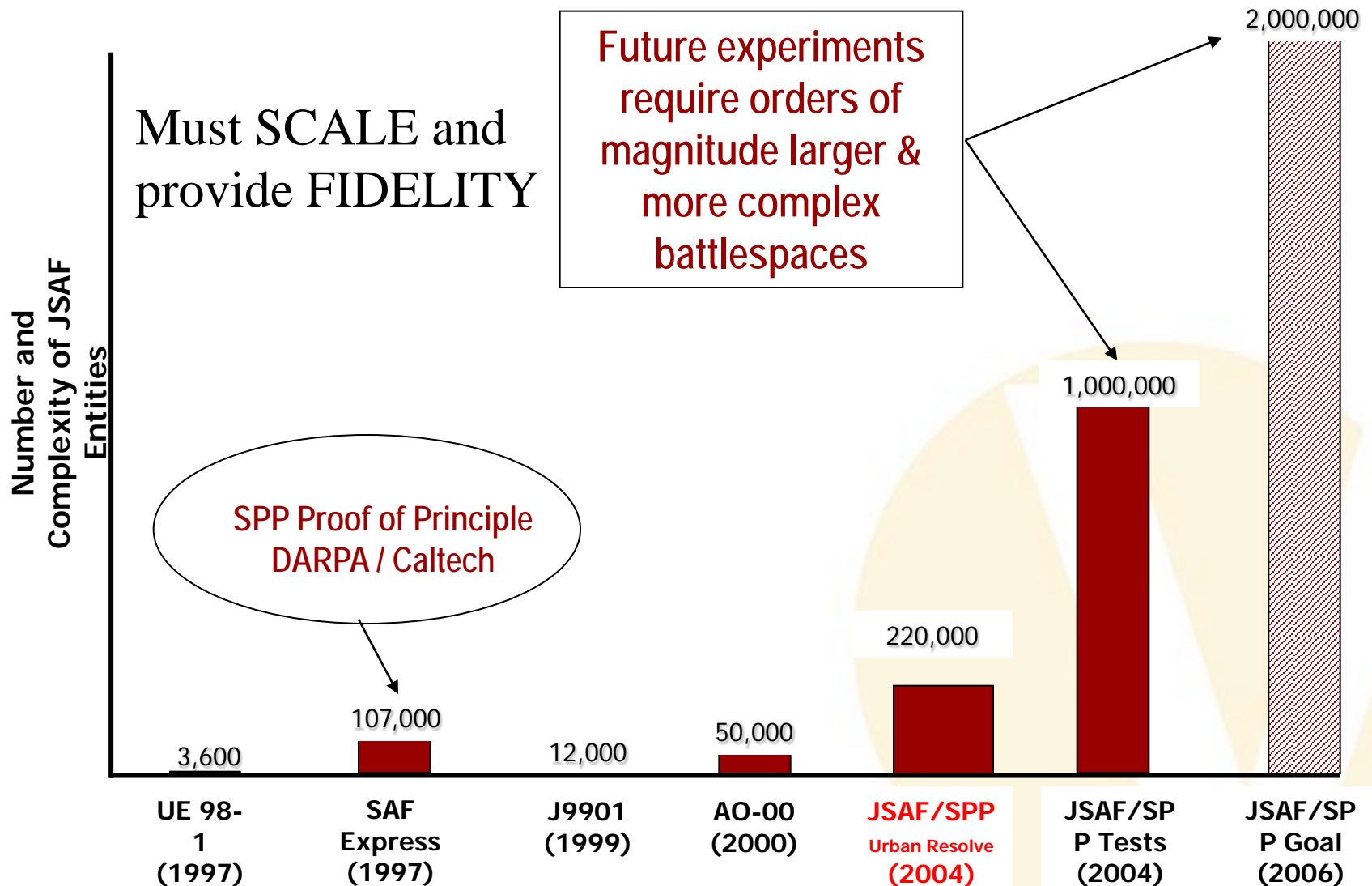
2 million entities (soon)

Support for Warfighter in Urban

Resolve 2015.

Developing future military tactics
and doctrine







Interactive Computing Infrastructure



Maui and Ohio

2 Linux Clusters

24x7 support by HPCMP

Real-time interactive supercomputing

Users in VA

~400 in Suffolk

~50 in Ft. Belvoir

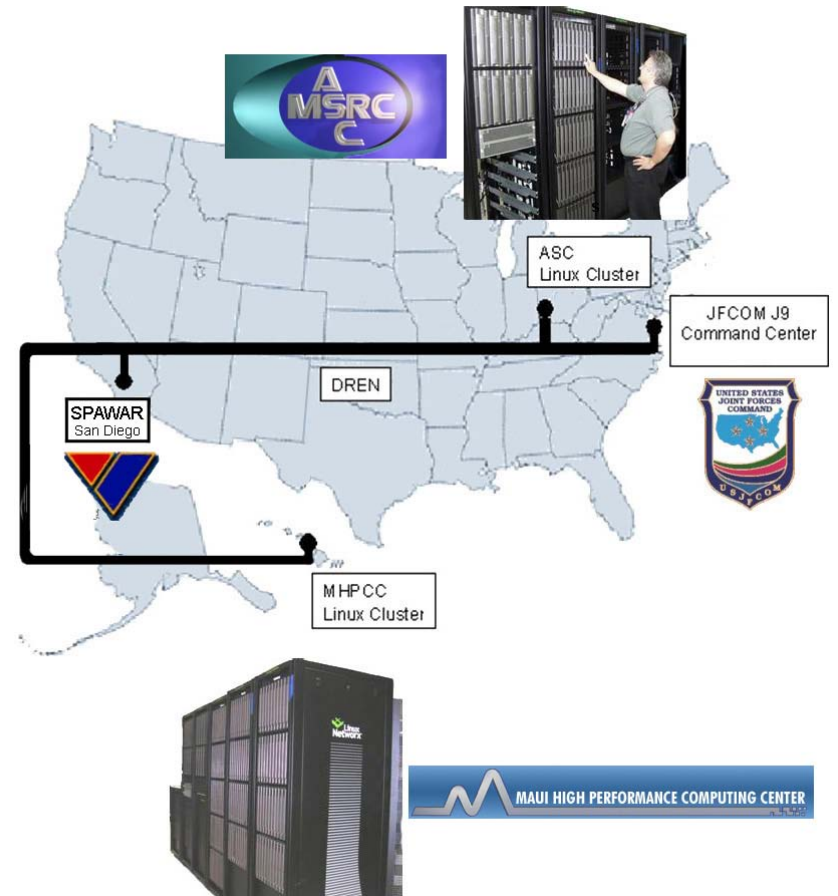
Mid-West

~20 at Ft. Knox

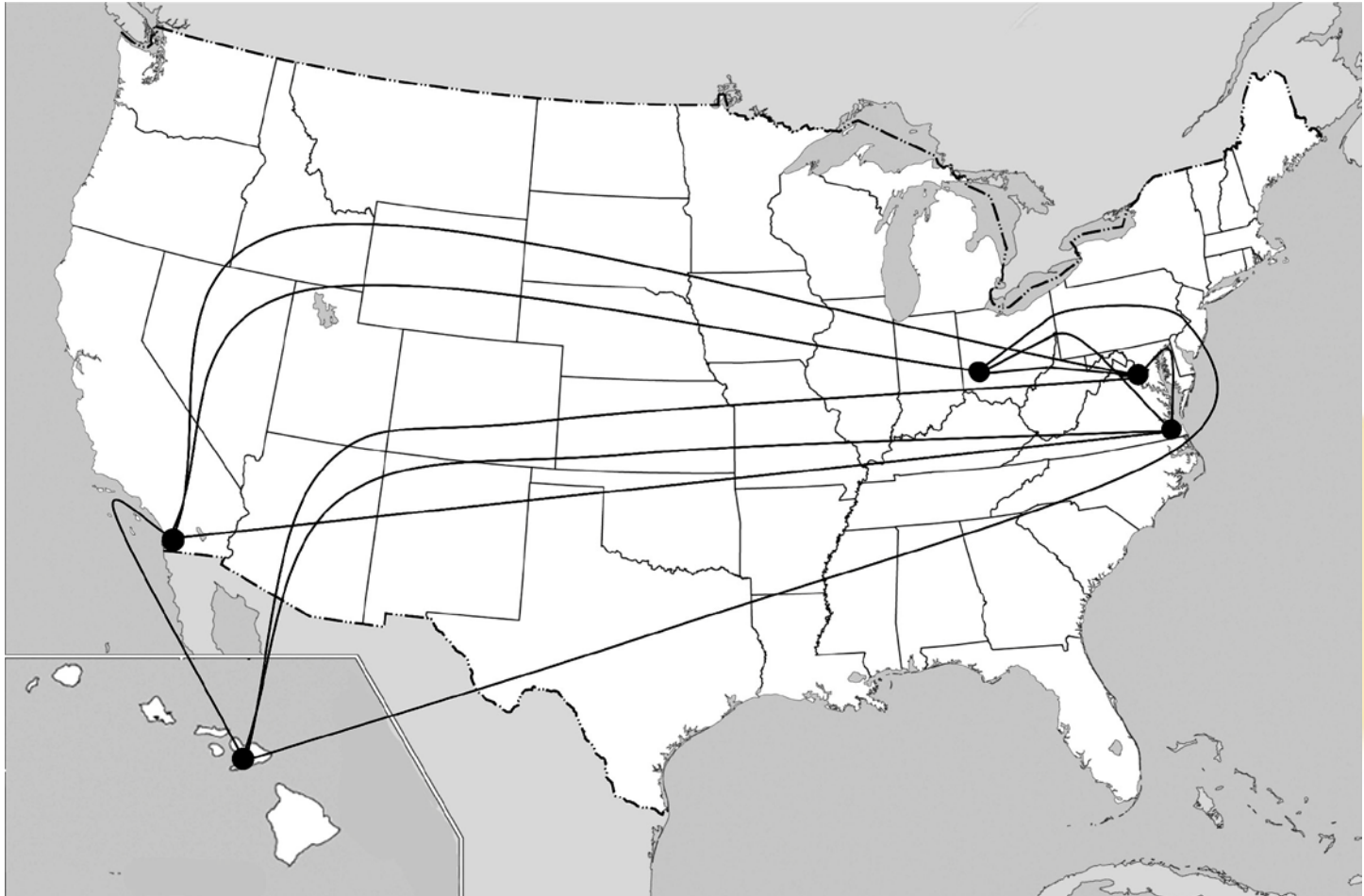
~20 at Ft. Leavenworth

and CA

~20 at SPAWAR SDiego



JFCOM Mesh Diagram (Notional)





Urban Resolve Participants



JFCOM – Suffolk Virginia (Tidewater Area)

TEC – Ft. Belvoir Virginia

DTRA – Ft. Belvoir Virginia

SPAWAR – San Diego California

US Army – Ft. Knox, Kentucky

US Army – Ft. Leavenworth, Kansas

ASC MSRC – WPAFB, Ohio

MHPCC – Maui Hawai'i



Challenges

Ownership

Usage model

Security Policies

These limit the resources accessible to FMS community

Not to say that we don't appreciate ...

Stability

Support

Encouragement



Batch Tradition

CDC 6600's at Univ of Colo

1975

Waiting, not for Gordot, but for output

Investment everywhere in batch

Both \$\$s and time

Emotional attachment



Who “owns” the machine?

MSRC's

Allocated DC's

DC's

DHPI's

Issues

Software

Maintenance

Data retention





Security Policy



Started with Kerberos

Problem with users

- Nearly 500 warfighters

- Each at Terminal

Problem with code

- Many new processes spawned by code

- Not under direct control of secure ID'ed operator

Secure environment and need for latitude



Security and Taboo Software Support



Security rules prohibit some common J9
procedures

VNC/debugger issue

Oprofile performance monitor

Testing *Totalview*

Currently investigating licensing
issues and availability

Need some window into clusters





Future Work Needed and Planned



HPCMP should lead the way in developing
interactive HPC for the warfighter

FMS is high visibility activity

Personnel at terminals are wearing uniforms

Must resolve

Security

Use model





Summary



Interactive capabilities for the JFCOM Joint Experimentation Directorate Provide:

- Global scale
- Higher fidelity
- Orders of magnitude more entities

They were the most effective due to:

- HPCMP provision of clusters at MHPCC and ASC-MSRC
- Development under the watchful eye of parallel architects
- Support by experienced staff at the centers
- Assistance of PET personnel (Pratt & Amburn)





**“And now,
a message from our sponsor.”**



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