Summary of OpenClovis Training

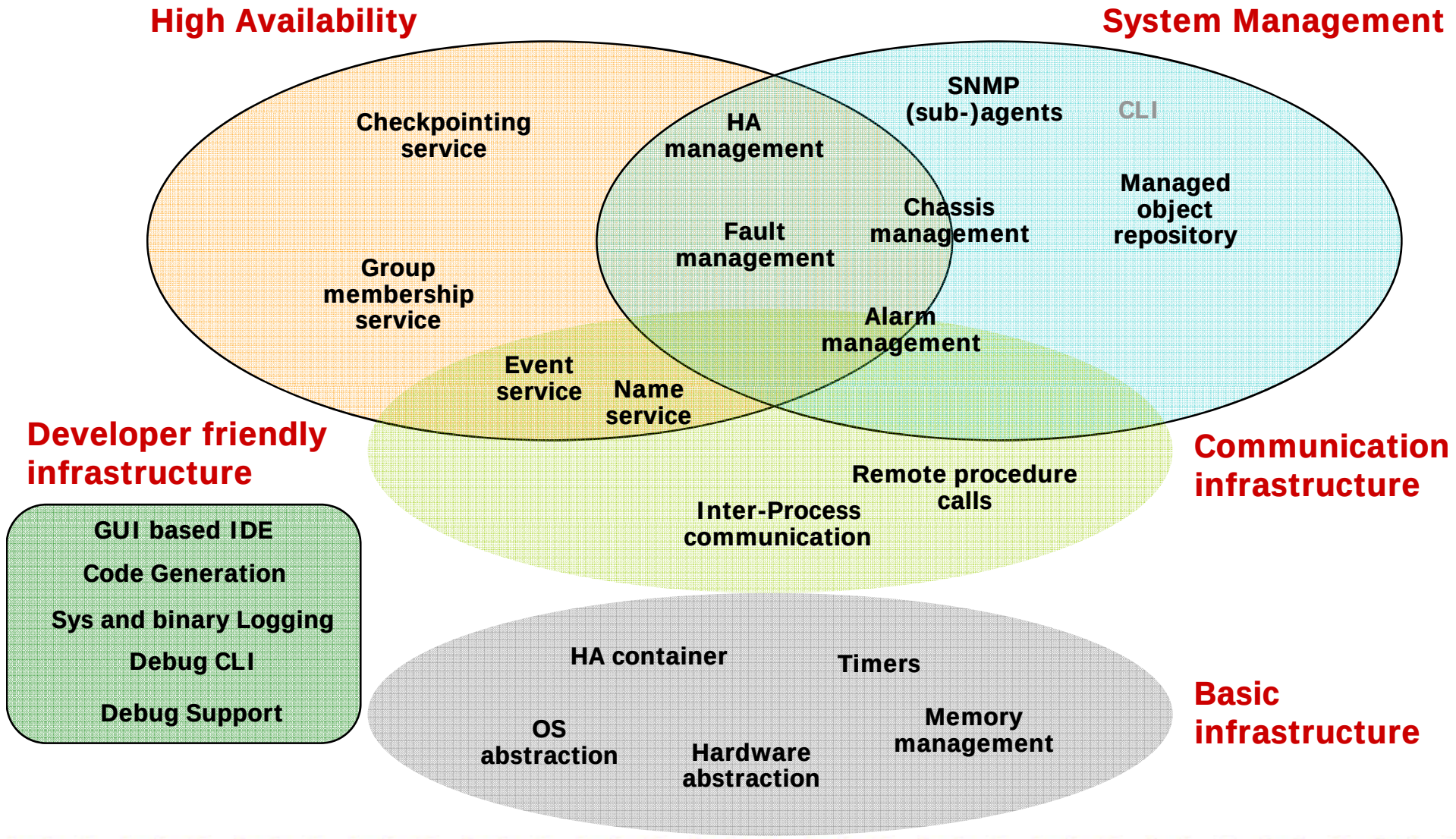
Claude Saunders

Participants

- Trainer: **Ron Yorgason of OpenClovis**
- Trainees
  - **From FNAL Linux Cluster Control and Monitoring Project**
    - Jim Kowalkowski
    - Amitoj Singh
    - Nirmal Seenu
  - **From FNAL ILC/NML and Instrumentation**
    - Kevin Krause
    - Alexei Semenov
  - **From ANL**
    - Claude Saunders
    - Shifu Xu

- We were trained on the not-yet-released new version of OpenClovis (was called 2.3, now called 3.0)

Product Overview



High Availability
Techniques to achieve it, and OpenClovis solutions

- **Offline Techniques**
  - Engineering
    - Design
    - Discipline
  - Over design for spare capacity

- IDE automation results in fewer bugs and errors
  - **MIB Import**
  - **Code Generation**
- Code base "hardened" in multiple environments
- Professional design services

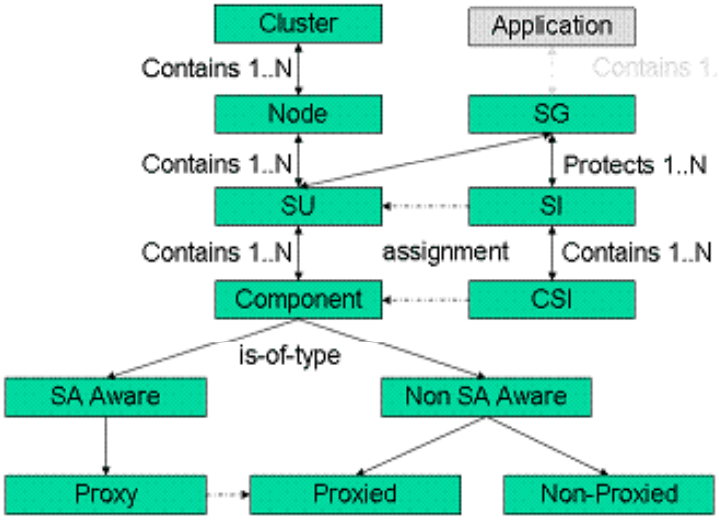
- **Runtime Techniques: Infrastructure**
  - Monitor the system
  - Recovery and repair
  - Services to offload application need to deal with failure

- Platform Management
- Alarm Management
- Component Management

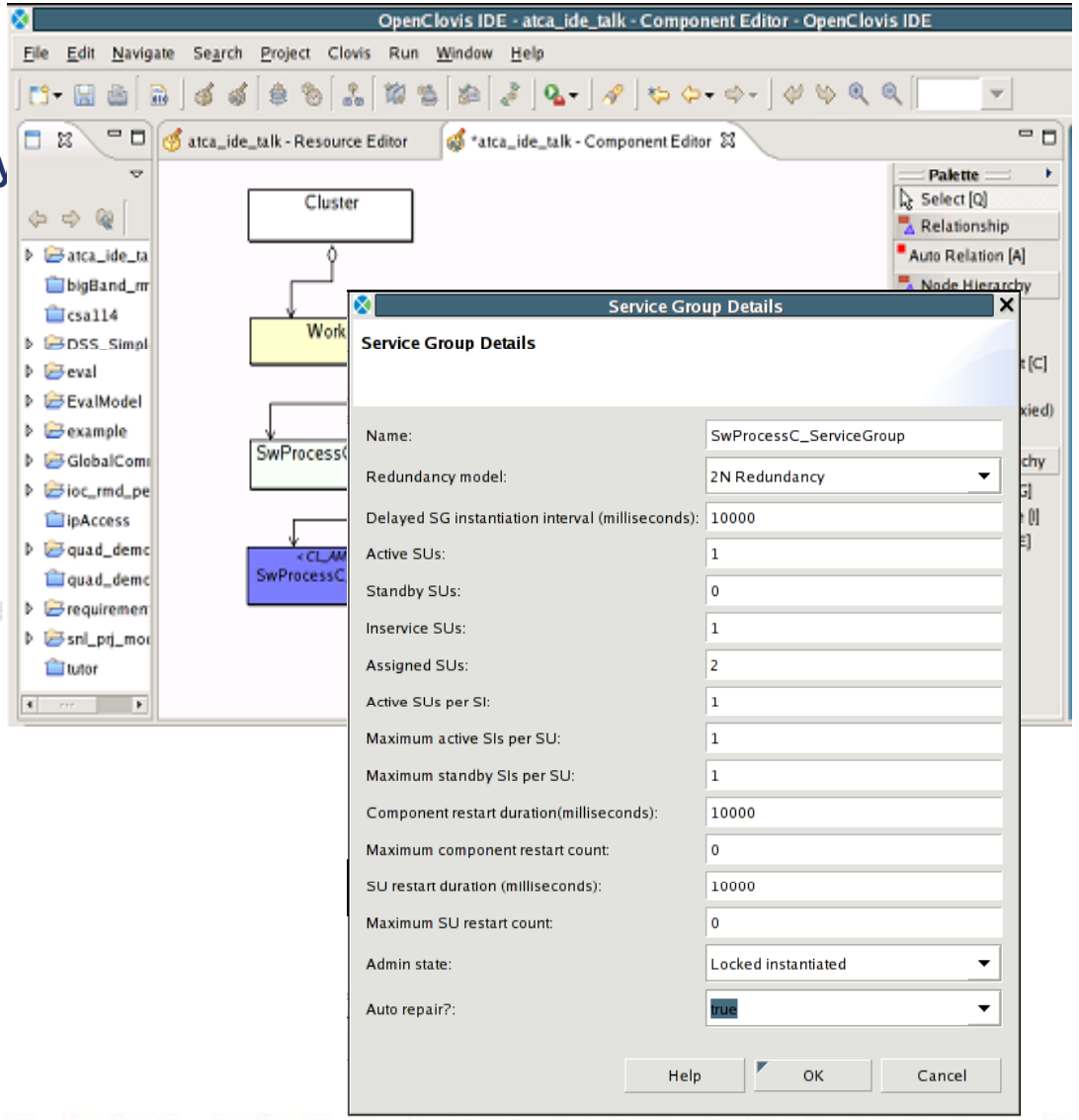
- Availability Management Framework
- Fault Management

HA Modeling

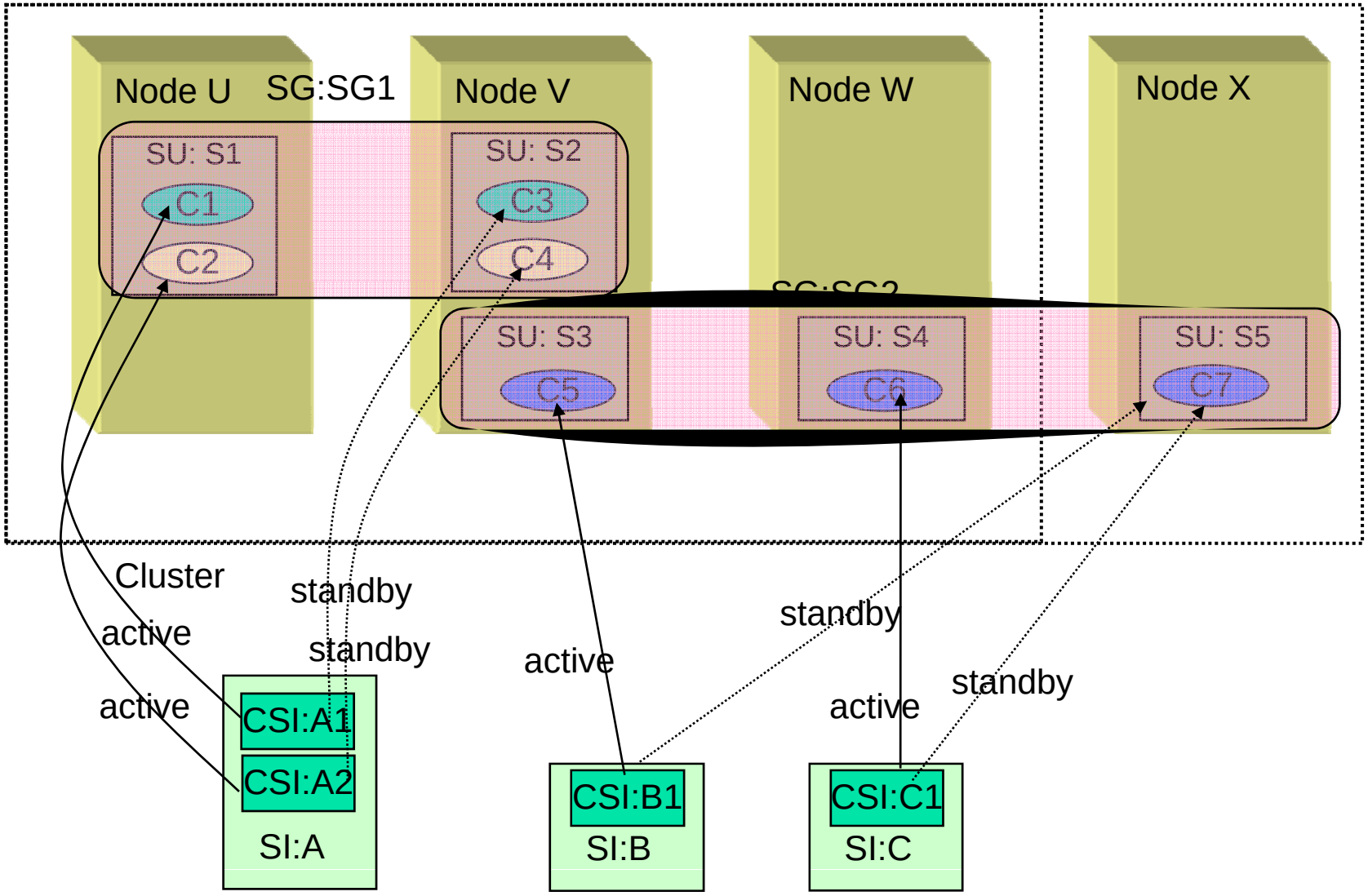
- SAF System Model made easy
  - **1:1 UML constructs**
  - **Wizards to automate and simplify the process**
  - **Pull down menus to customize properties**
  - **Validation tools to ensure correctness of model**



SAF HA Model



AMF: SAF HA Model Example



OpenClovis Release 2.2

- **High Availability**
  - **Availability Management (2N redundancy models)**
  - **Checkpointing Service**
    - Asynchronous
    - Collocated
  - **Fault Repair**
  - **Cluster Membership**

- **Platform Management**
  - **Alarm Management**
  - **Provisioning Support**
    - Pre-provisioning
    - HW proxies
  - **Chassis Management**
    - HPI MIB support

- **Core Infrastructure**
  - **Component Management**
    - Boot Management
    - Component health monitoring
  - **Basic Infrastructure**
    - Debug and Logging support
    - Transaction with two-phase commit and rollback

- **Platforms**
  - **Big-endian support**
  - **Mixed-endian support**
  - **Linux 2.6 based distributions**
  - **SMP**
  - **Itanium 64-bit support**

OpenClovis Release 2.3 Features

- **Overall**
  - Upgradeability support
  - Integrated with Wind River tool chain
- **Platforms**
  - SUN Netra ATCA Platform
  - Radisys Promentum 60x0 ATCA chassis and other chassis
  - Additional Linux 2.6 based distributions (WindRiver PNE Linux)
- **Basic Infrastructure**
  - Intelligent memory management
  - Support for binary log streams
  - Runtime and Offline Log Viewers
- **Communication**
  - TIPC migration
- **High Availability**
  - Generalized Group Membership
  - N+M redundancy model
- **Node Management Infrastructure**
  - Arbitrarily nested managed objects (MOs)
  - Node/blade independent MOs
  - MO attribute access modes
  - Transient MO attributes
  - Run-time metadata retrieval
- **System Manageability**
  - Integrated platform management
- **SDK / OpenClovis IDE**
  - Improved work-flow support
  - Tool integration via XML files
  - Enhanced MIB import
  - Usability improvements
  - SNMP code auto-generation
  - Project model templates
  - Improved application code generation
  - SAF API Generation

OpenClovis Release 3.0 – *in planning*

- Beta in Q3 of 2008
- Platform
  - **Full AMC support**
  - **MicroTCA support**
  - **Additional Processors (i.e. Cavium)**
  - **Multi-Chassis support**
  - **Solaris Support (Collaboration with Sun)**
- Middleware Manageability
  - **Run-time model configuration upgrade**
  - **Run-time north bound middleware configuration**
- Upgrade Services
  - **Currently in-process in SAF**
- IDE
  - **Increase code generation coverage**
  - **Tighter build integration**
  - **Target deploy and debug capability**

Summary

- We were duly impressed with the depth and breadth of OpenClovis, despite the fact that:
- Ron the trainer was
  - A) Not very good at teaching
  - B) Only familiar with parts of OpenClovis
- A good part of what we got from training was a result of concentrated self-study and discussion (ie. being locked in a room for 3 days).
- Many questions remain.
- Product behaved well.
  - One problem with multi-failover lab.
- Scalability an open question. Hopefully Linux Cluster project can test these limits (1000+ nodes).

- A good portion of what we learned was about what the SAF specifications mean in practice.
  - This knowledge should be transferable to other SAF implementations if needed.