



Building Open Scalable and Highly Available Software Architectures

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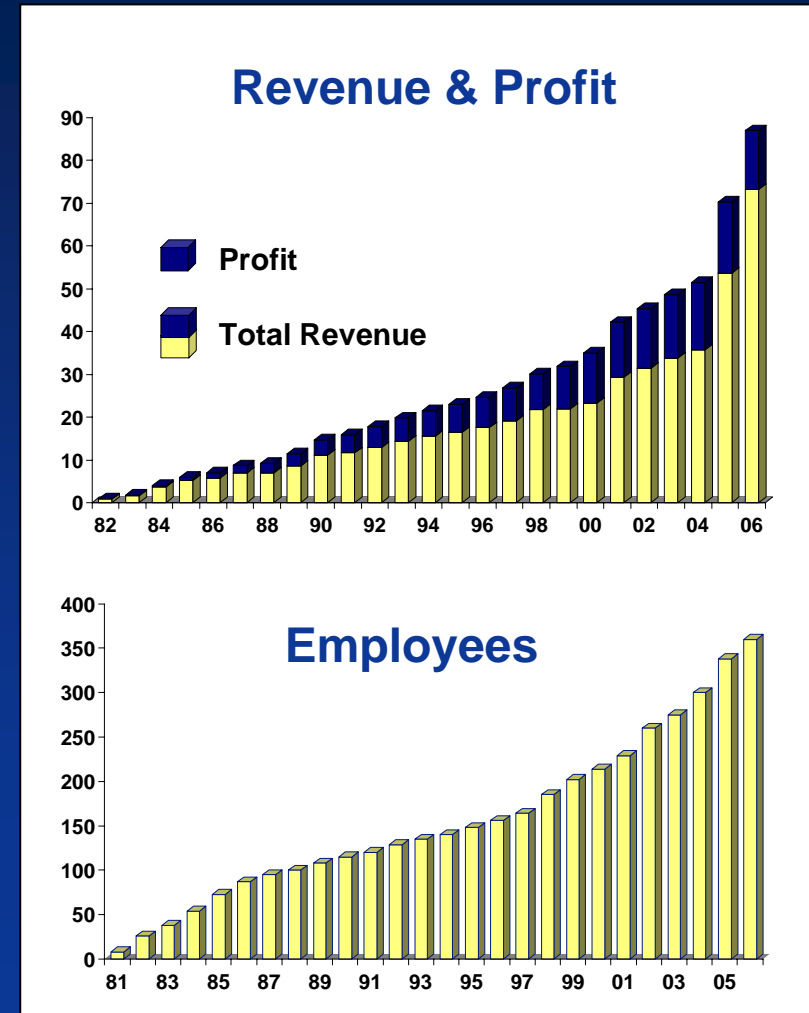
Data Connection Ltd. (DCL)

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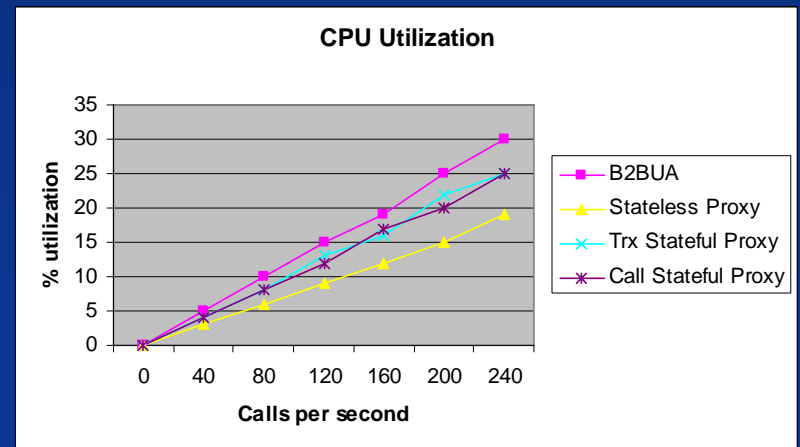
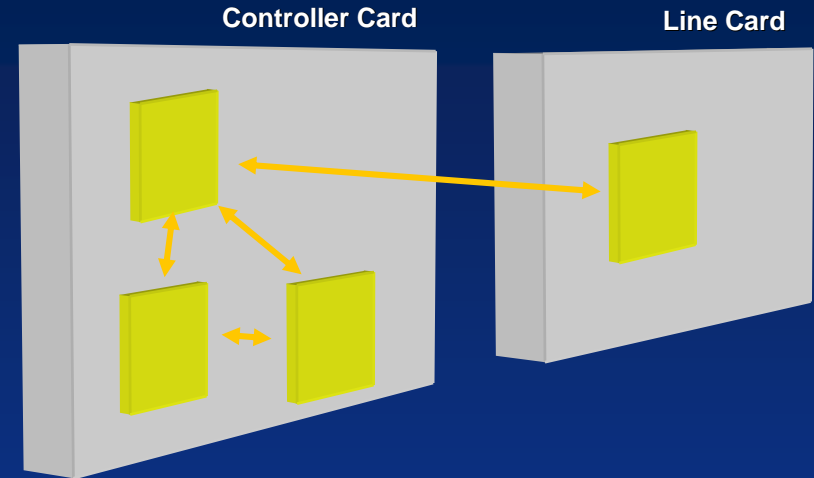
Data Connection Overview

- **Background**
 - Founded in 1981
 - Headquarters in Enfield, UK
 - 400+ employees across 7 WW locations
- **3 Divisions**
 - **Network Protocols Division**
 - Enterprise Connectivity Division
 - MetaSwitch
- **Success Factors**
 - Highest quality
 - Superior support
 - Engineering excellence
 - Supplier stability, longevity

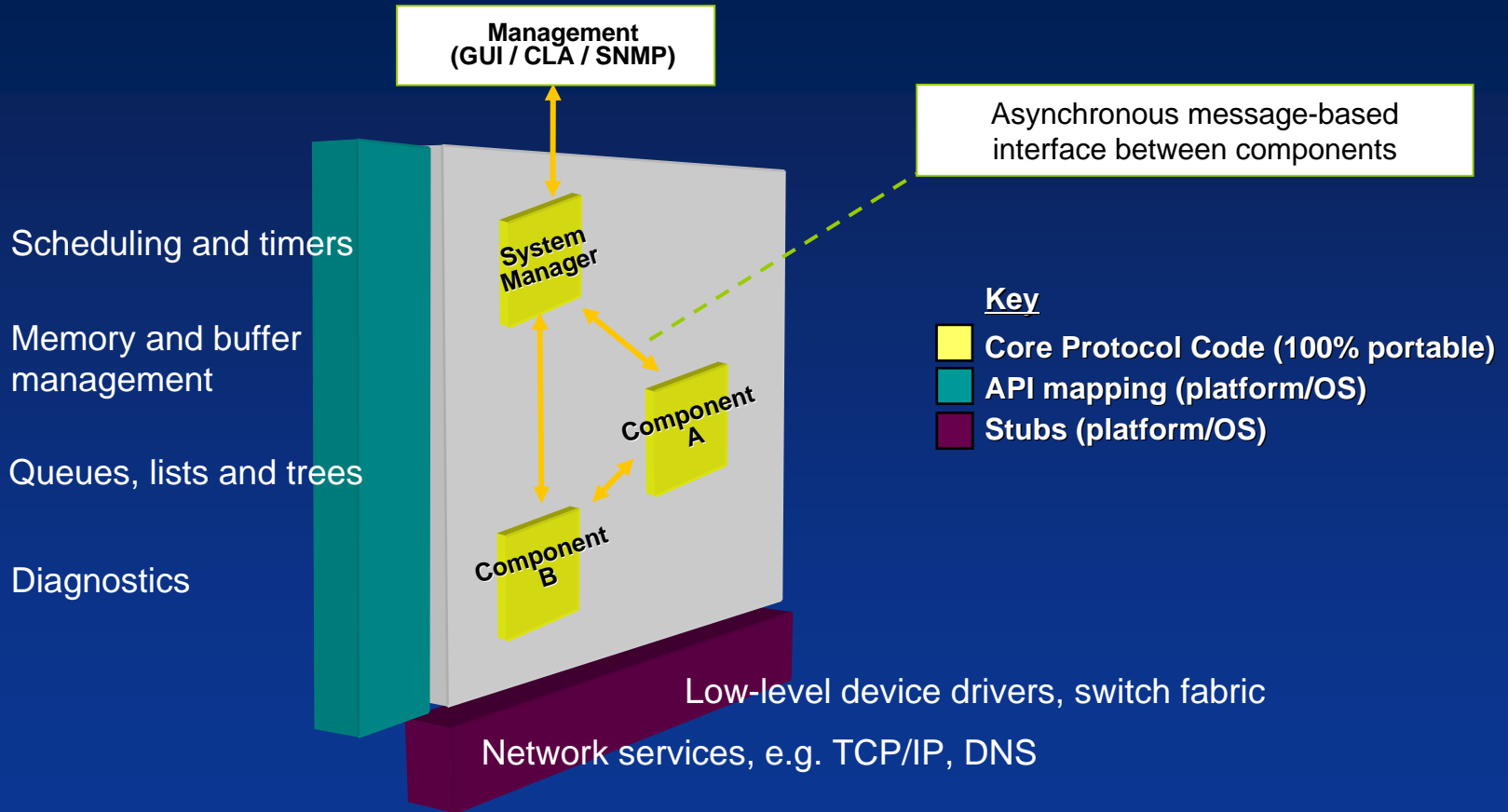


Design Goals – Scale + Performance

- No hard-coded limits
- Manage bottlenecks
 - Decouple processing with message-based interfaces
 - Flow control between components
 - Tunable scheduling
- Modular architecture
 - Distribute function across multiple threads, tasks, processors, cards, etc.
 - Location transparency
- Efficient processing
 - Tunable algorithms for caching and memory management
 - Search optimization – insert vs. find



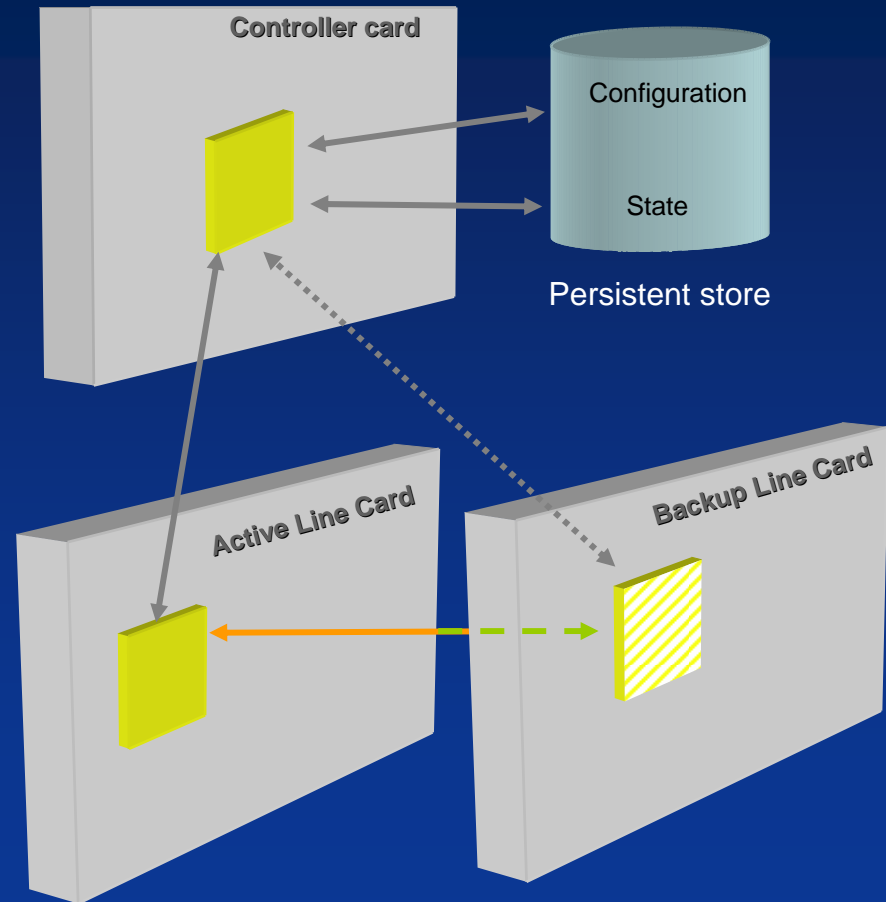
Data Connection Architecture



Designed for scale, modularity, and high availability.

Design Goals - High Availability

- **Fault prevention**
 - Defensive programming
 - Testing
- **Architect to minimize impact**
 - No single point of failure
 - Distribute function
 - Non-stop operation during recovery
 - Graceful restart or state replication
 - Hot standby
 - Persistent store
- **Fault recovery management**
 - Identification and isolation
 - Manage failover / restart of components
 - Reconnect active components
 - Audit
- **In-service upgrade**
 - Manage failover
 - Map information between versions



High Availability Framework

DC System Manager

- Creates backup process if required
- Initiates replication procedures
- Handles failovers

Keep alive et al



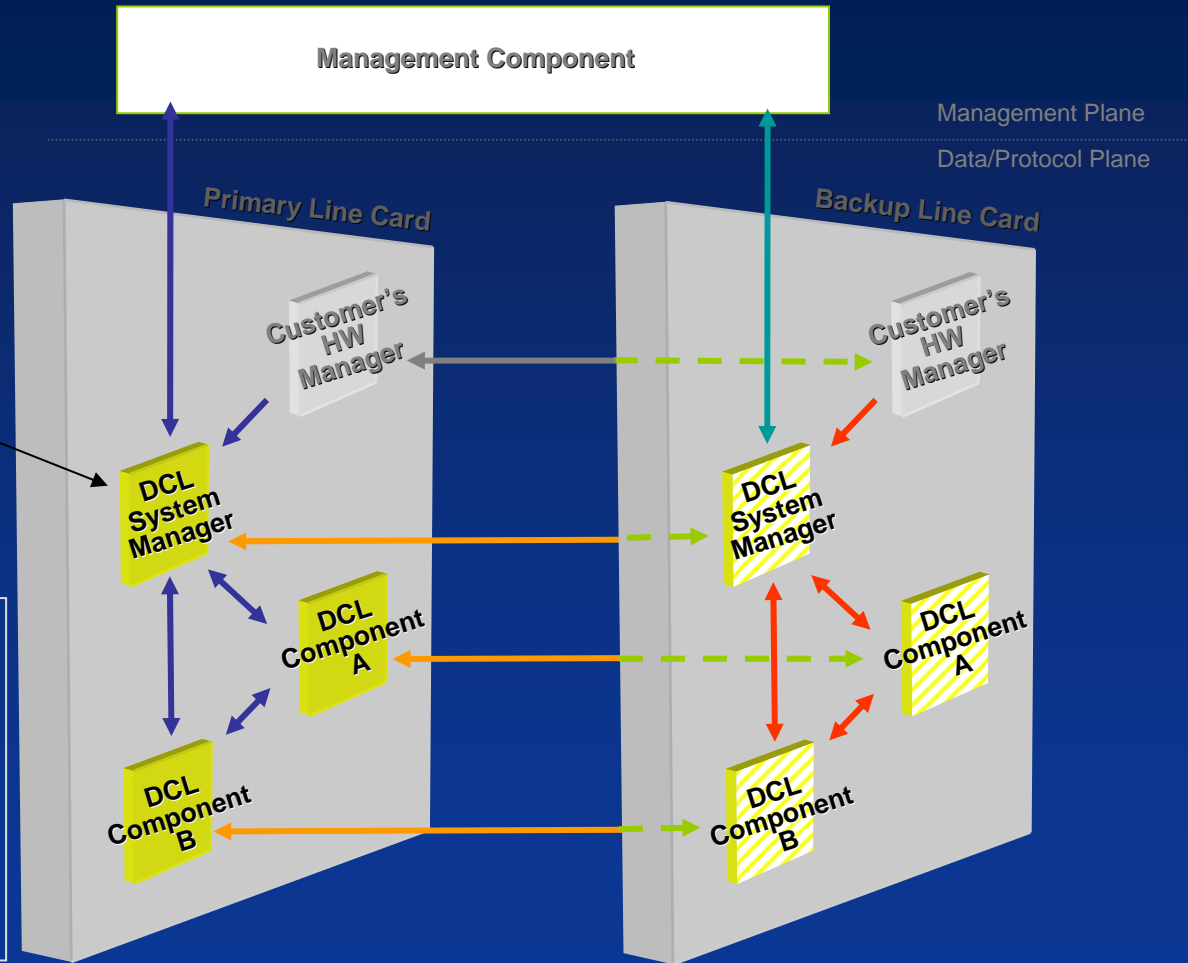
State and/or configuration replication



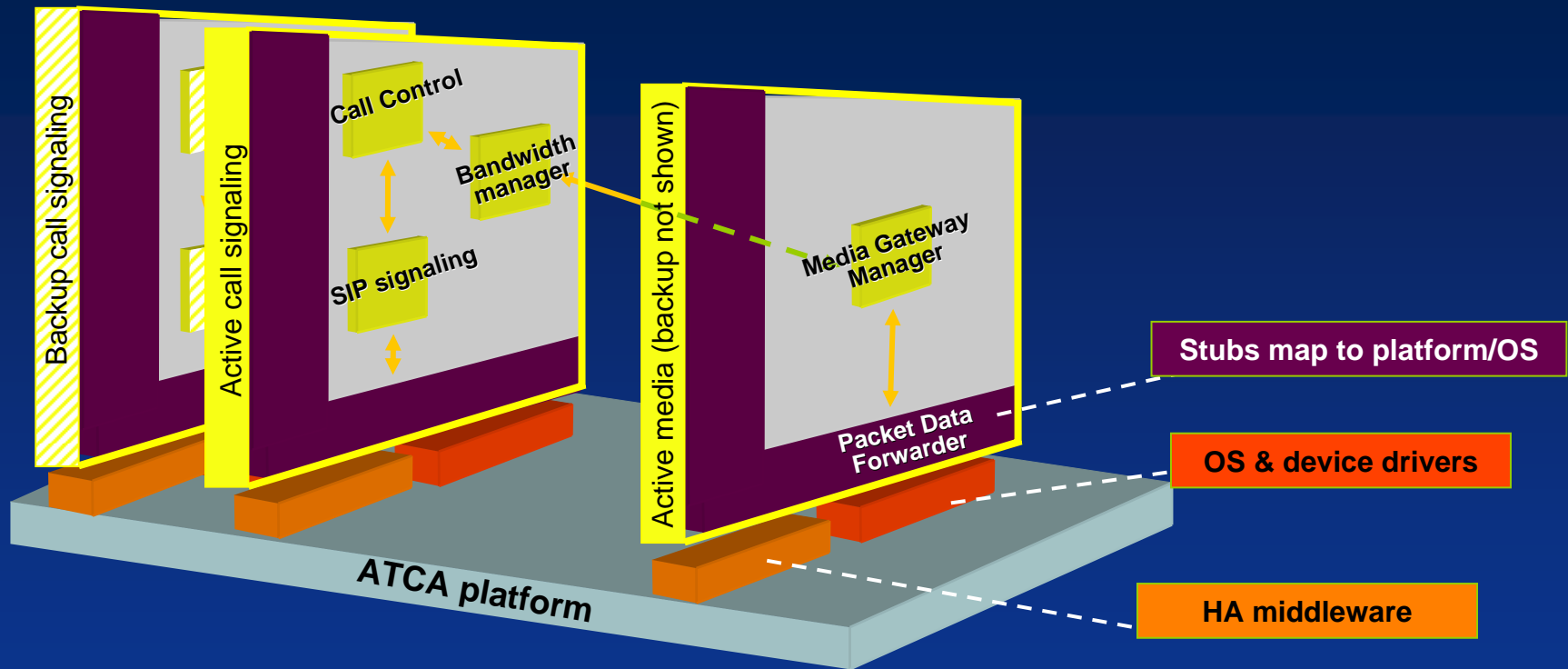
Active connections



Inactive connections



Example – DC-SBC on ATCA



- Software architecture is a very good fit with ATCA
 - Strong interest in SBC and other IMS applications
 - Significant proportion of DCL's new business is on ATCA platforms

Conclusions

- Scalability and High Availability impose new requirements
 - Flexible hardware architecture and scheduling
 - Scalable storage and search algorithms
 - Recovery from complete and partial failures
 - In-service upgrade/downgrade
- Impacts whole design from initial architecture
 - Cannot be added to existing product
- Data Connection is the protocol software expert
 - Implementations with proven performance
 - Pre-integrated solutions with our partners