Application of DCMI in an Internet Portal Data Center

Harry Rogers
Principal Hardware Architect
Bryan Kelly
Systems Engineer

Microsoft®
Global Foundation Services

Microsoft

Disclaimer

The information contained in this document represents a current view of Microsoft Corporation on the issues discussed as of the date of publication. Because Microsoft must respond to changing market conditions, it should not be interpreted to be a commitment on the part of Microsoft, and Microsoft cannot guarantee the accuracy of any information presented after the date of publication.

This presentation is for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AS TO THE INFORMATION IN THIS DOCUMENT.

Complying with all applicable copyright laws is the responsibility of the user. Without limiting the rights under copyright, no part of this document may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the express written permission of Microsoft Corporation.

Microsoft may have patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this document. Except as expressly provided in any written license agreement from Microsoft, the furnishing of this document does not give you any license to these patents, trademarks, copyrights, or other intellectual property.

The names of actual companies and products mentioned herein may be the trademarks of their respective owners.

IPDC Server Characteristics

- Server infrastructure leverages industry “sweet spots”
- Application-level or virtualization-level redundancy is assumed (Law of Large Numbers insists that hardware will fail.)
- Low-touch
  - Too many servers to physically/manually touch on a regular basis
  - Data centers are too large to physically access any given server quickly

Understanding Out-of-Band Manageability Benefits

- Start with accounting of operational data center tasks
  - Cost
    - Current manual and/or physical touch cost
    - Projected automated and/or logical touch cost
    - Effects of manual-process errors
  - Frequency
- Evaluate Costs and Benefits of Automating Tasks, *e.g.*:
  - Automation of triage data collection
    $ Development automated triage process
    \+ Higher percentage of directed tasks
    \+ Fewer triage errors
    \+ Reduction in time to resolution
- Prioritize automation accordingly
- Implement the low-hanging fruit
- Repeat

Microsoft

Replacement of Improvised Out-of-Band Infrastructure

- Many data centers employ aggregations of out-of-band controls and sensors:
  - Serial Concentrators: Remote configuration & debug
  - Managed PDUs: Monitoring/control of power
- *But:*
  - Implementations are not standard
  - High cost at scale
  - Prone to physical configuration errors
- DCMI can supplant this infrastructure
  - One standard to support
  - Integration lowers cost
  - Integrated solution eliminates configuration errors

Large-scale DCMI Benefits

- Simplicity of Usage Model
- Triage of HW Events
- Movement of Physical-touch Operations to Logical Space
  - Reset/Power Cycle
  - Reconfiguration
  - Power down of aberrant servers
- Automation

Automation of Physical Manageability

DCMI's reliability and resiliency facilitate automation of offline system recovery. Some benefits:

- Reduced Response and Resolution Times:
  - Out-of-band access to the system event log (SEL) enables robust, automated triage and failure analysis.
  - Corrective Work-flow: Automated system recovery with DCMI reduces human errors.
- Serial-Over-LAN: Text-mode console redirection

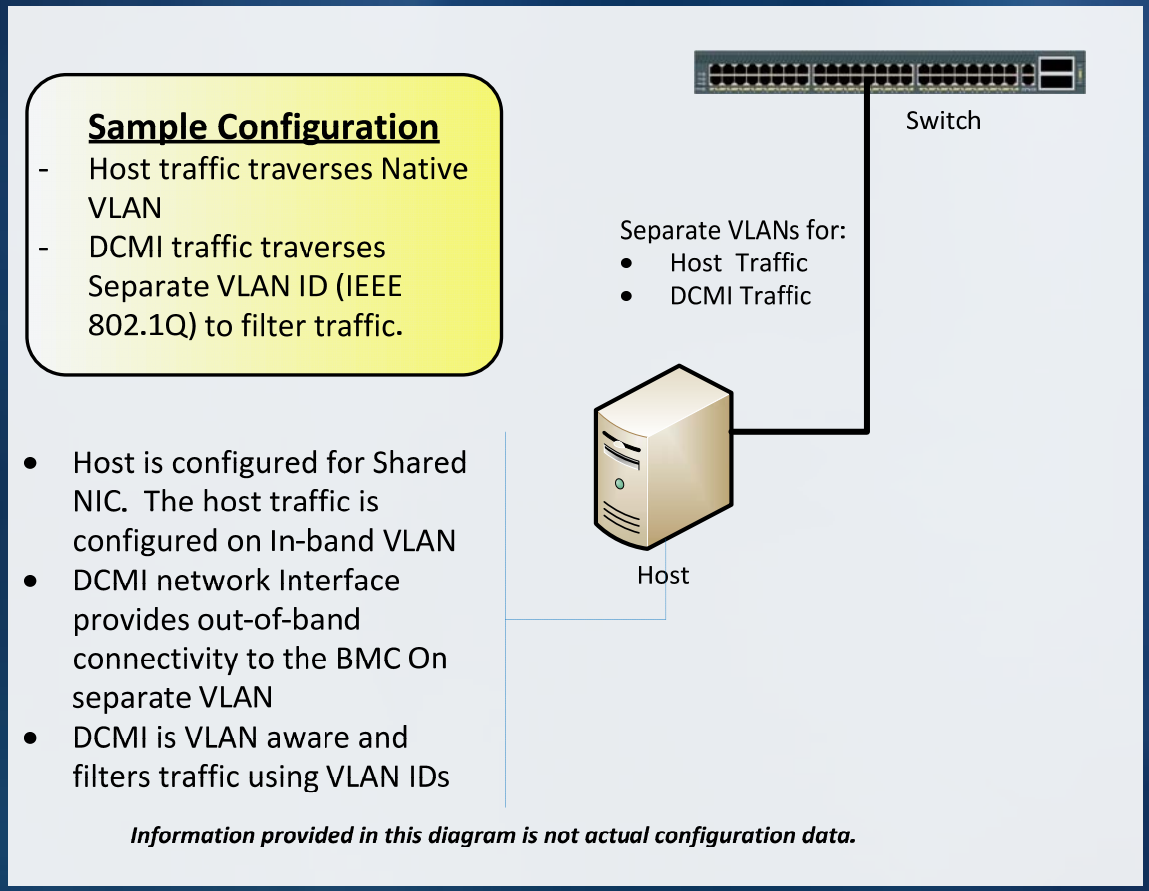
$\Rightarrow$ OOB/remote access to BIOS and OS recovery consoles

Infrastructure Implementation: LAN – Shared NIC

Flexible infrastructure offers scalability at low implementation costs.

•DCMI has support for both shared and dedicated NIC configurations.

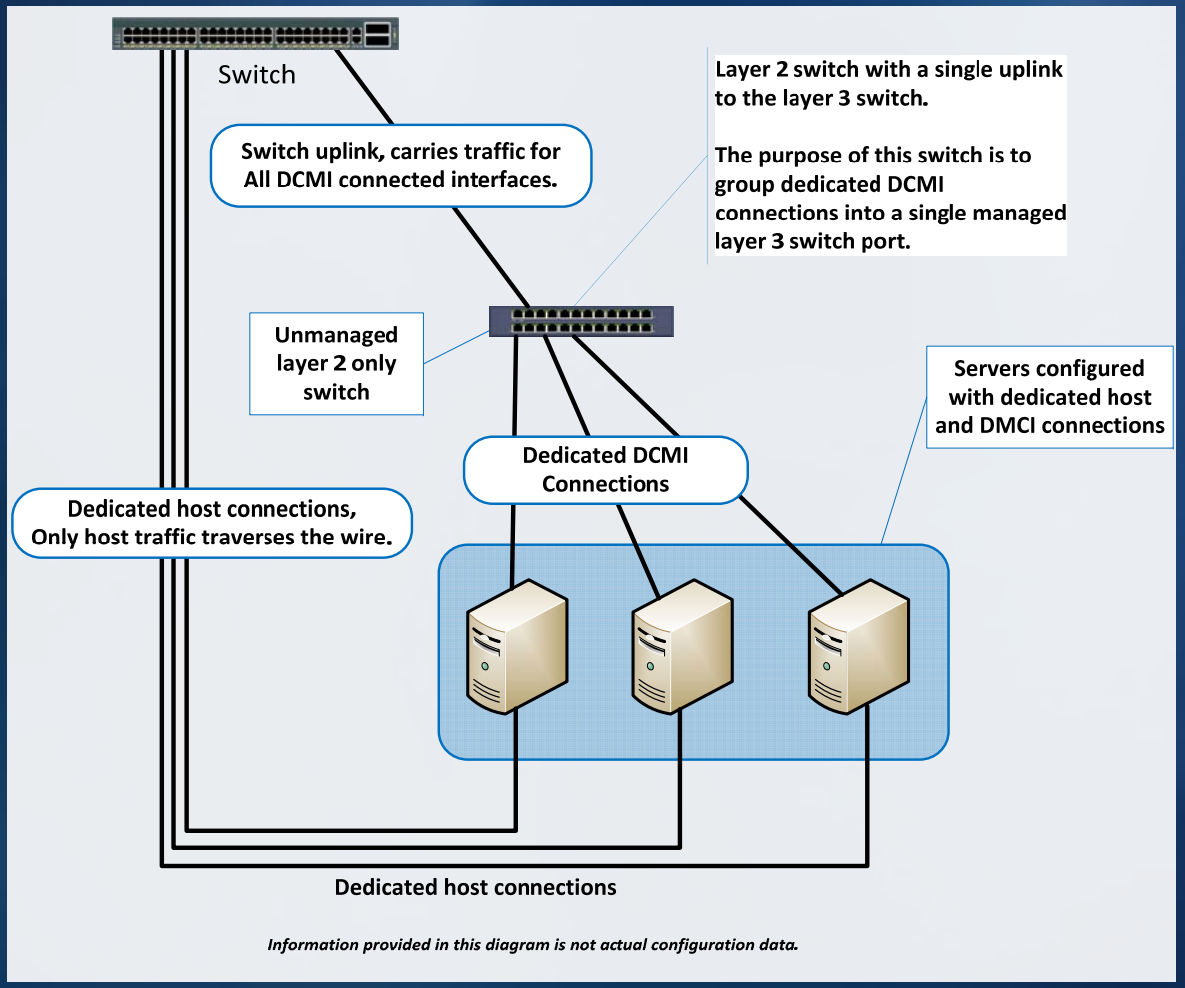
•Since DCMI is VLAN aware, shared NIC configurations can logically separate DCMI and production traffic on a shared wire.



Microsoft

Infrastructure Implementation: LAN – Dedicated NIC

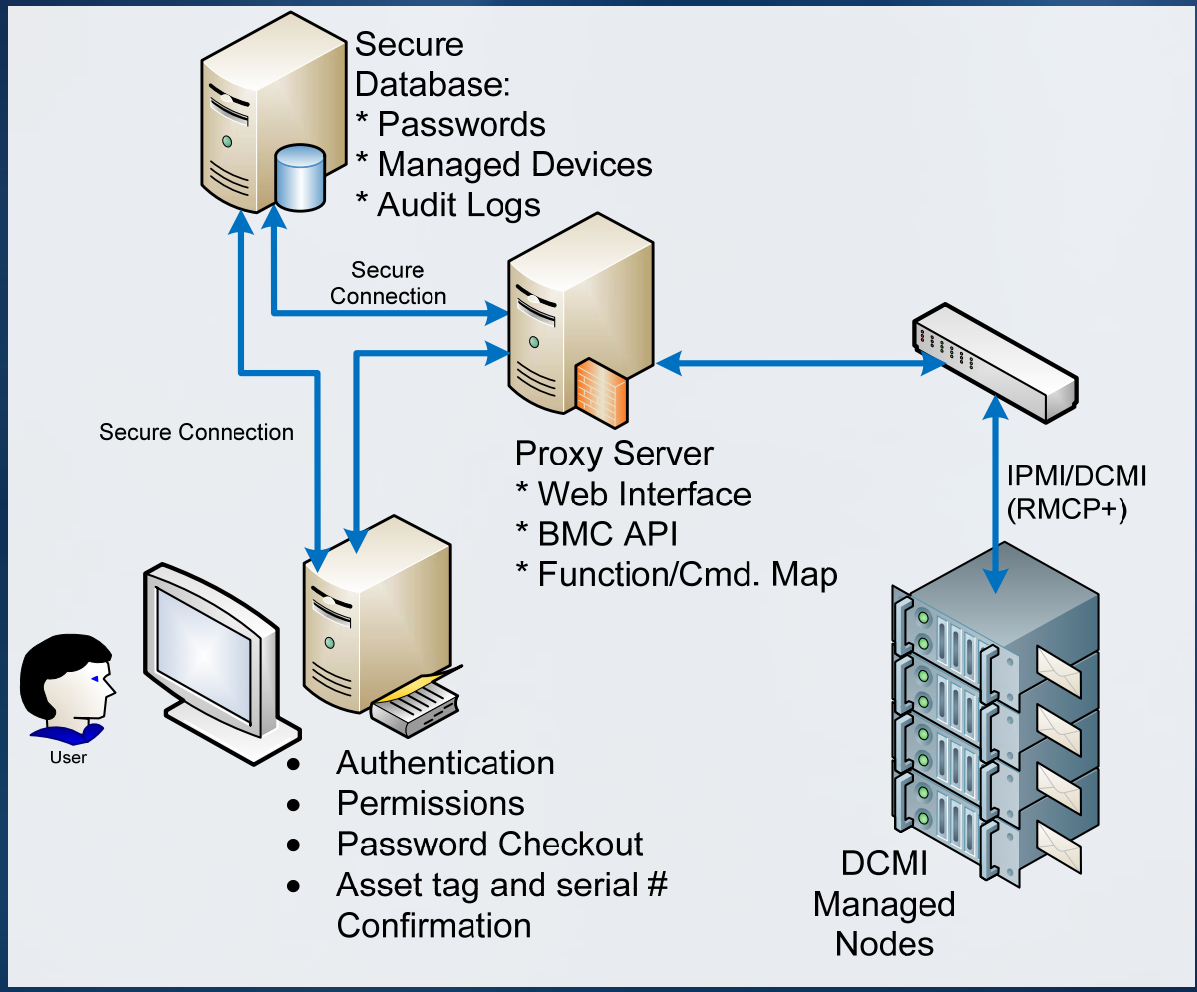
Interface reliability and controlled network behavior complement layer 2 aggregation of dedicated NIC configurations



Microsoft

Sample Enterprise Console Architecture

- Abstraction of session and transport
- Abstraction of feature Set
- Delegation of authentication
- Platform for process automation



Microsoft

In-band Operational Model

- Correlation of Application/Physical Metrics
  - Optimization of application efficiency
  - Infrastructure Planning
  - Chargeback of infrastructure
- Physical management of servers
  - In-band management is preferred
    - More resources available
    - More efficient
    - More versatile
  - Out-of-band is still necessary for when OS is not installed or operational

Sample In-band Operational Architecture