DCIM Software Awareness Workshop
The Data Center
Traditional Data Center Operations

Facilities & IT Operating in Silos
Traditional Data Center Operations

**Challenges**

- BMS solutions designed for critical infrastructure. Not tailor made for data centers
- Traditional IT Management tools not designed to monitor and manage critical infrastructure components.
- Both categories do not interface with each other and work on different network architecture and communication protocols
- Creates lack of visibility on the cascading effect of failure of facility components on application or service availability
- Results in inability to right-size facility infrastructure capacity in response to new IT requirements
- Results in complexity in management and data inconsistency due to multiple tools in the data center environment
The Origin of DCIM: *Bridging the Gap*

DCIM: Single solution for end-to-end data center monitoring & management
Role of DCIM

**DCIM functions:**
- Data collection
- Environmental monitoring and reporting
- Asset, configuration and change management
- Power management
- Data reporting
- Capacity planning, forecasting, simulation and analytics
- Optimization, operational BI, load management

**DCIM benefits:**
- By delivering right information at the right time DCIM ensures highest level of availability
- Allows optimized efficiencies by integrating information from IT and facility assets
- Future-proof architecture based on Capacity Planning and BMS data that supports design changes
How DCIM Helps

Since DCIM Software dynamically captures information related to asset utilization, power consumption, environmental conditions and other parameters, it

- Helps Data Center Manager avoid unnecessary over-provisioning
- Helps plan investments and new capacity
- Helps reduce the capital costs
- Helps reduce power use and other operating costs
- Helps reduce risk of failures through critical alerts
- Helps adapting to technical and business change more easily
- Helps improvement plans through real-time metrics & dashboard
GFS Crane Functional Capabilities

- Asset Management
- Energy Tracking
- Energy Efficiency
- Sustainability Reporting
- Capacity Planning
- Business Continuity
- Energy Billing
Data Center Operations Priorities

Operational Priorities
- Control Cost
- Improve Availability
- Improve energy efficiency
- Improve operational efficiency

Business Goals
- Increased profitability (Yield per sq. ft.)
- Meet Business SLA
- Green Data Center
GFS Crane: How it helps achieve your business goals?

- Increase Profitability
  - Increases Revenue
  - Reduces Cost

- Availability
  - Proactive Alarms
  - Better Impact Analysis
  - Change Tracking

- Process Automation
  - Better Monitoring

- Operational Efficiency
  - Tracks Energy & Emissions
  - Recommends ways to improve efficiency

- ‘Green DC’

Helps to run an efficient data center operation
Increase Profitability: *Increase Revenue & Reduce Cost*

- **Increase Profitability**
  - Increases Revenue
  - Reduces Cost

- **Operational Efficiency**
  - Process Automation
  - Better Monitoring

- **Availability**
  - Proactive Alarms
  - Better Impact Analysis
  - Change Tracking

- **GFS Crane DCIM**
  - Tracks Energy & Emissions
  - Recommends ways to improve efficiency

- **‘Green DC’**

---

- Better visibility helps in discovering hidden power, space, cooling and compute capacities which in turn helps in maximizing utilization of existing resources
- Plug revenue leakage through real-time monitoring of capacity used by customers vis-a-vis contracted capacity
- Ability to bill customers on variable usage above a contracted limit

- Better monitoring & analytics helps to improve efficiency and reduce operating cost on power
- Automation of processes like Asset Tracking, Provisioning & Monitoring improves productivity
- Rationalizing asset base helps in lower maintenance overhead like equipment AMC
Improved Availability: *Predictability, Visibility & Change Tracking*

- Advanced Alarm Management helps in failure predictability, faster turn-around-time and hence improved availability and SLA compliance
- Consolidation of alarms from different facilities helps in centralized monitoring

- Improved visibility of the power chain and the relationships among critical components of the infrastructure helps in better impact analysis of device malfunction or failure and doing RCA

- Change Tracking in the data center environment helps in doing impact analysis of any change and root cause analysis of any outage occurring due to a change
Operational Efficiency: *Process Automation & Better Monitoring*

- **Process Automation**
  - Automation of critical data center processes like Asset Management, Capacity Planning and Provisioning improves efficiency of data center operations.

- **Better Monitoring**
  - Improved visibility of the power chain and the relationships among critical components of the infrastructure helps in better impact analysis of device malfunction or failure and doing RCA.
  - Change Tracking in the data center environment helps in doing impact analysis of any change and root cause analysis of any outage occurring due to a change.
Green DC: *Track Energy & Emissions for Data Center*

- **Cost Reduction**
  - Controls CapEx
  - Reduces OpEx
- **Availability**
  - Proactive Alarms
  - Better Impact Analysis
  - Change Tracking
- **Operational Efficiency**
  - Process Automation
  - Better Monitoring
- **Tracks Energy & Emissions**
  - Recommends ways to improve efficiency

**Track Energy & Carbon**
- Measures real-time power consumption of at device level with soft-metering and intelligent meters
- Can integrate with existing BMS to capture non-IT power
- Calculates real-time PUE and analyzes PUE trends
- Calculates GHG emission and carbon footprint for the DC

**Recommendations**
- Recommends ways to reduce IT power by server retirement, virtualization and replacement
- Identifies power distribution loss in the power chain and helps in improving infrastructure efficiency
- Recommends ways to improve PUE
DCIM Software
Case Study
Customer Profile

- Leading integrated infrastructure player in the Finance Sector

- Embarked on an enterprise-wide Energy & Sustainability Management Program

- Among the first to adopt Data Center Infrastructure Management (DCIM) software in India

- The primary data center is Uptime Institute Tier III certified
What did they want from the system

- The ability to monitor real-time large amounts of data from the whole infrastructure wherever located and not be invasive in the process

- The intelligence to interpret it to provide a range of accurate addressable information against a wide range of parameters

- The flexibility to report the results at all significant levels of management, and at all levels of activity within the infrastructure over any period of time

- The ability to highlight system or performance critical events by alerts in addition to the normal reporting schedules or on demand
Findings & Recommendations
Customer found that the data center computing resources were heavily under-utilized and there was immense scope for optimization.

Average CPU utilization of servers in the Data Center was just above 3%
Findings & Recommendations

DCIM identified under-utilized servers that could be candidates for retirement resulting in lower power consumption, lesser emission and lower power bills for the data center.

Similarly found candidates for Virtualization
Findings & Recommendations

Customer had not done an aging analysis of devices in the data center before DCIM was implemented.

DCIM enabled –

- Identification of old servers which had depreciated and could be replaced with more energy efficient devices.

- Replacement options from within were identified, saving on capex.
### Maturity Levels

- **Basic (Level 1)**
- **Intermediate (Level 2)**
- **Advanced (Level 3)**

#### Measurement Methodology & Frequency

<table>
<thead>
<tr>
<th>Measurement Methodology &amp; Frequency</th>
<th>Maturity Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Facility Power</td>
<td>Basic (Level 1)</td>
</tr>
<tr>
<td></td>
<td>Intermediate (Level 2)</td>
</tr>
<tr>
<td></td>
<td>Advanced (Level 3)</td>
</tr>
<tr>
<td>IT Power</td>
<td>UPS</td>
</tr>
<tr>
<td></td>
<td>PDU</td>
</tr>
<tr>
<td></td>
<td>Server</td>
</tr>
<tr>
<td>Frequency of measurement</td>
<td>Monthly/weekly</td>
</tr>
<tr>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>Continuous</td>
</tr>
</tbody>
</table>

- Depending on size, scale and tier of a data center, its efficiency program can mainly be at three levels of maturity namely Basic, Intermediate and Advanced.
- Green Grid recommended three levels of PUE calculation corresponding to the maturity levels as illustrated in the table below.

→ Customer had been measuring weekly PUE from UPS output till now, in line with Basic Maturity Level.
→ Customer is now measuring IT power from the BUSBAR output to each rack which is being captured by DCIM to provide daily PUE report. Hence they comply with the Intermediate Maturity Level now.
→ Customer has started measuring power consumption of individual servers and other IT devices at 95% accuracy using the ‘soft-metering’ capability of the DCIM. Customer will soon be upgrading the PUE measurement process to the Advanced Level and monitor the PUE of the data center continuously through the DCIM.
The Financial Savings

- Energy Efficiency: 15% reduction in annual power bills. Their average growth in power costs was 10% pa;

- Asset Utilization: improvement by 5% through annual savings in server procurements due to better utilization;

- Operational Efficiency: 10% annual savings due to better capacity planning in terms of power, cooling, rack and floor space, improved productivity and higher uptimes & better SLA due to timely preventive maintenance of devices.
Better Information provides greater opportunities

- Save Energy
- Optimize the activity/power use in servers/devices
- Maximize the use of space within racks
- Increase uptime and sustainability
- Delay/reduce the need for more floor space and support devices
- Meet regulatory reporting requirements
For more details:
Visit
http://www.greenfieldsoft.com,
Or email
sales@greenfieldsoft.com