Data Center Infrastructure Management (DCIM)

By Jesse Zhuo

Agenda

- The Evolution of DCIM
- Users' Perspectives
- Management Methodology by Delta DCIM

The Evolution of DCIM

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What is DCIM

DCIM is software for Data Center Infrastructure Management.

"Data center infrastructure management (DCIM) tools **monitor**, **measure**, **track** and sometimes **control** data center resources and energy consumption of both **IT-related** equipment and **facilities**' infrastructure components."

IT Glossary

DCIM Trend

Automation, modeling and prevention

Manage the resources to optimize your datacenter

To integrate both of the infrastructure and IT devices

Optimizing Datacenter Operation

Optimization

Measurement → Analytics → Plan → Action

Operation Manager

Power
- •UPS/ PDC/ PDU/ ATS
- •Generator
- •Power Meter

Cooling
- •Row-Cool/ Room Cool
- •Chiller
- •Pump/ Cooling Tower

Environment
- •Temperature/ Humidity
- •Leakage/ Smoking/ Fire
- •Motion/ Door Contact

Security
- •IP Cam/ NVR
- •Door Access

IT Device
- •Server BMC
- •Network Switch/ Router

Energy

PUE/ EUI
Electricity Cost
Energy Analysis

Capacity

Analysis
Prediction

Work Order

Template
Schedule/ Event Trigger
Statistics and History

Capacity

Power
Cooling
U-Space
Weight
Network

Asset

Modeling
Operation
Search
Connectivity
Failure Impact Analysis

Asset Inspection

On-site audit app
Download plan
Executing
Inspection log review
Statistics

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Users’ Perspective

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Management teams in Datacenter

IT Manager

- Where is my server physical located ?
- Is there any underutilized servers that I can consolidate ?
- Where do I place the next server?
- How will the new servers impact existing circuit and datacenter?
- Does the existing cooling and power have the capacity to accommodate new IT equipment ?

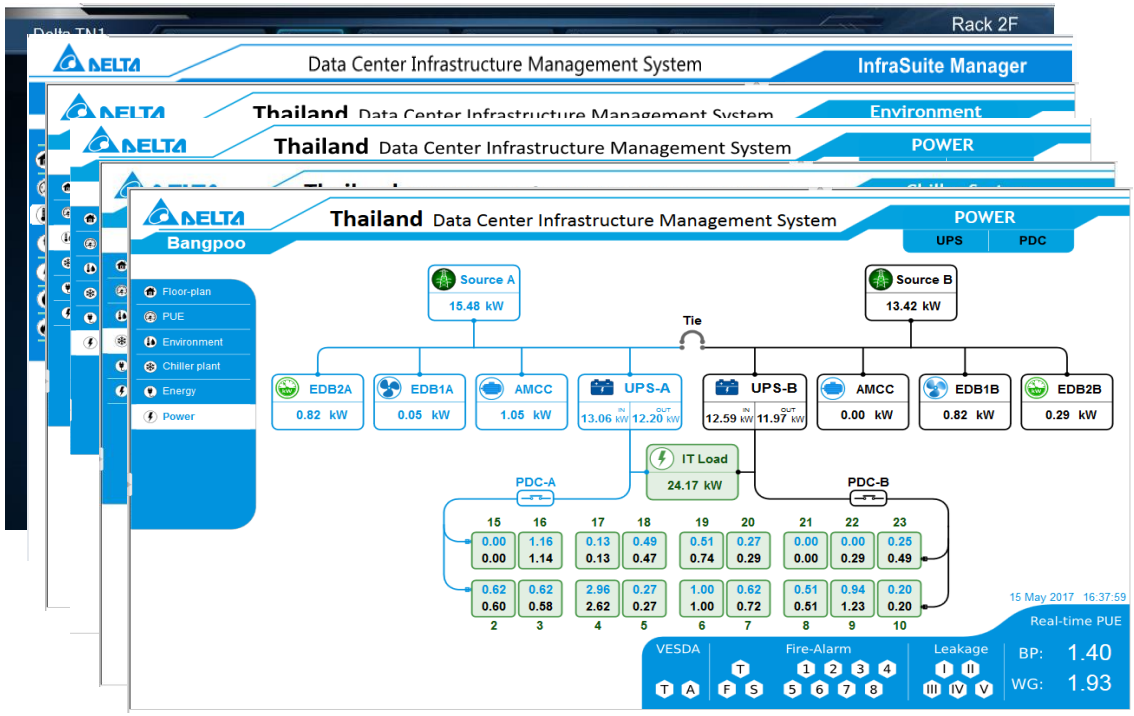
Facility Manager

- Where and how can I address the hotspot in the datacenter?
- What's the PUE in the datacenter?
- What do I have in the datacenter and where are they located?
- The CRAC is having an alarm, What is the problem? What do I do now?
- How can I automate the process when there is a fire in datacenter?
- 1 of the rack has exceeded the power capacity. What should I do?

C-Level Management

- What's the operation cost of the datacenter?
- How do I reduce the datacenter operational cost?
- When will the datacenter running out of power and cooling capacity?
- How efficient is the datacenter?
- When will I need to build another datacenter?

Empower every member of your datacenter team



Facilities Management

- Overall Layout of your datacenter
- Overall Environment mapping or profile of your datacenter
- All Equipment Status
- Chiller Plant Status and profile
- Power Diagram
- Alarm notification, reporting

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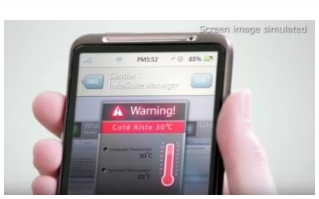
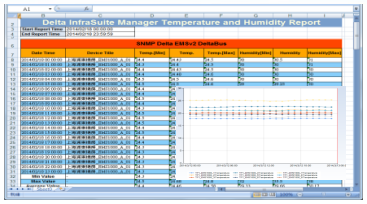
Empower every member of your datacenter team

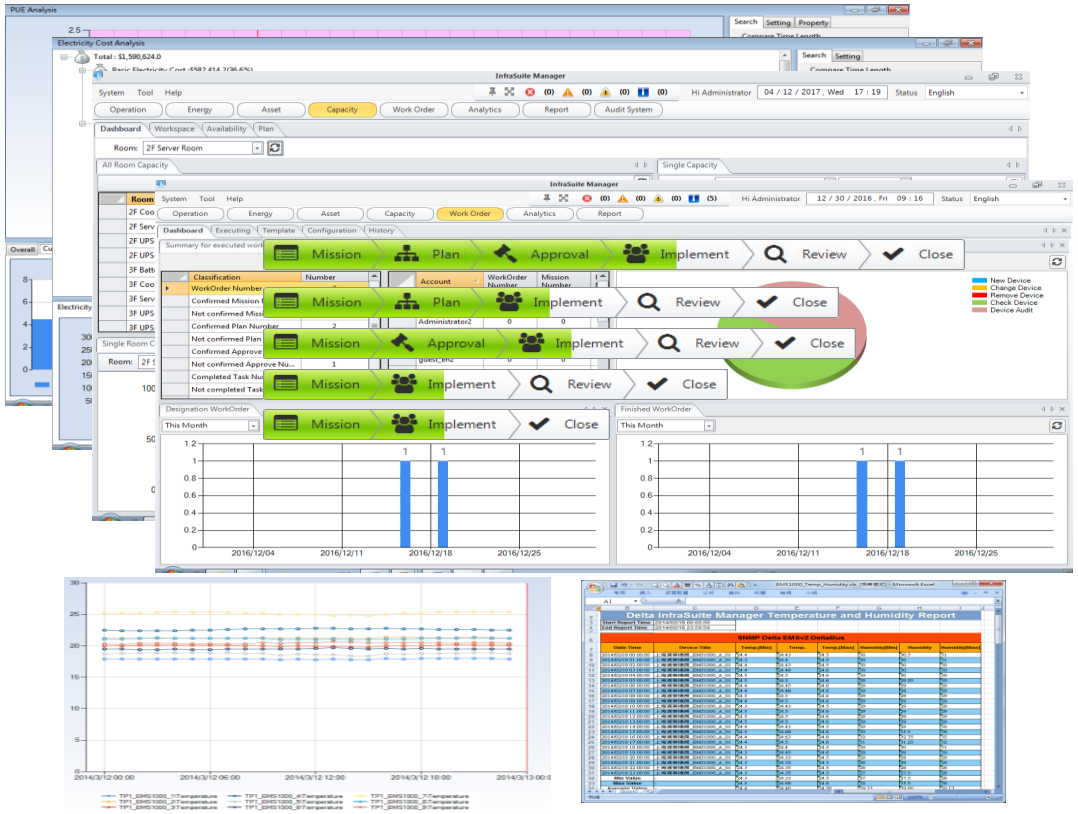




IT Management

- Access control and surveillance
- Asset Management
- Capacity of Rack, DC level for U space, weight, Power and Network
- Multiple site management
- Alarm notification, reporting, schedule, etc.

Empower every member of your datacenter team



C-Level management

- Real time and historical PUE
- Electricity Cost and billing
- Overall Capacity utilization
- Work order progress and approval process
- Alarm notification, reporting

Management Methodology by Delta DCIM

You cannot manage it without measurement

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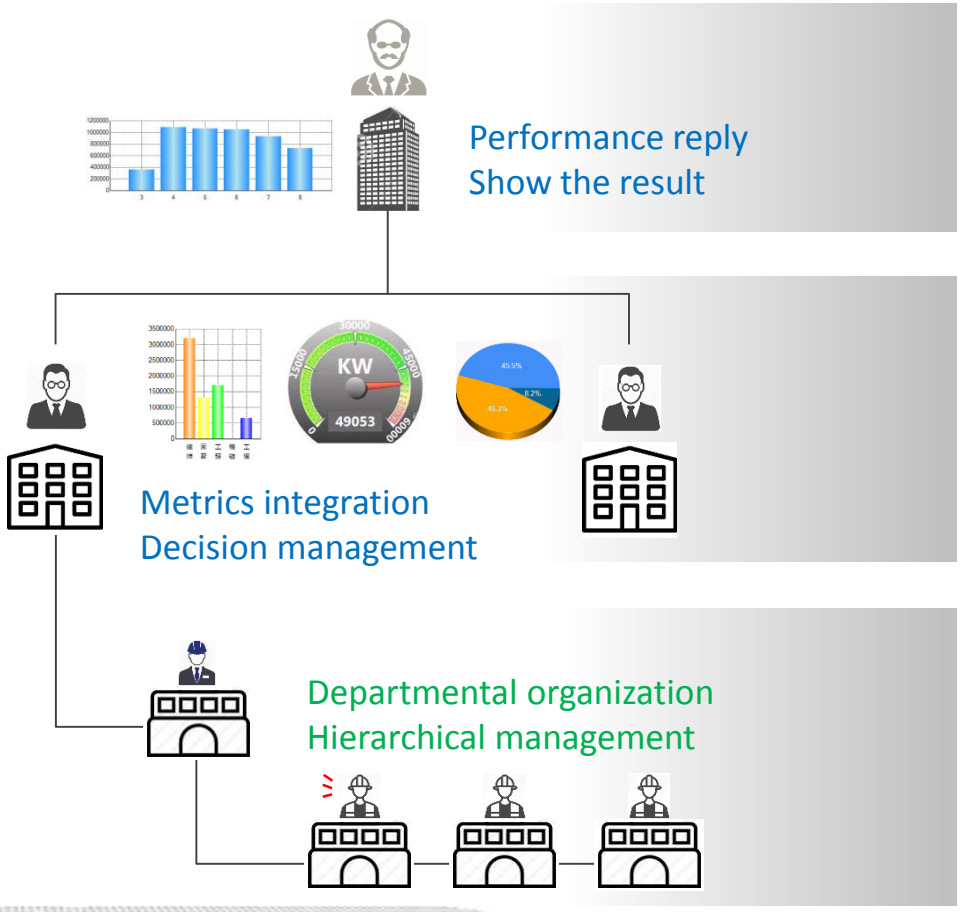
Equipment Monitoring

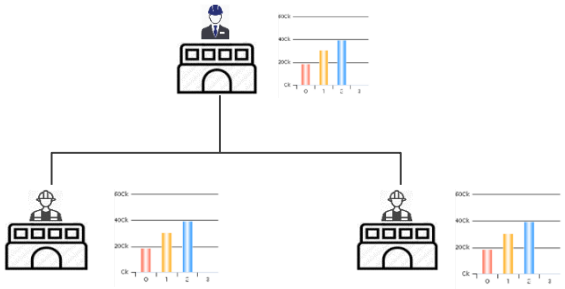
Be Organizational for

- Equipment monitoring
- Role-based management
- Monitoring privilege
- Control privilege
- Notification



Energy Management

Formula, Statistics

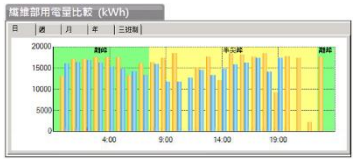


Formula

Statistics

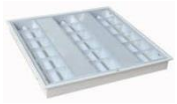
PUE

Cost



Data Collection, Integration, Transfer, Store

Energy Classification



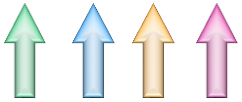
Illumination

Cooling

Office

IT Rack

Energy Type



Oil

Electricity

Gas

Water

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Advanced Energy Management

Building PUE model

Use measurable (controllable) parameters to construct a model to predict PUE

1. Total server IT load [kW]
2. Total Campus Core Network Room (CCNR) IT load [kW]
3. Total number of process water pumps (PWP) running
4. Mean PWP variable frequency drive (VFD) speed [%]
5. Total number of condenser water pumps (CWP) running
6. Mean CWP variable frequency drive (VFD) speed [%]
7. Total number of cooling towers running
8. Mean cooling tower leaving water temperature (LWT) setpoint [F]
9. Total number of chillers running
10. Total number of drycoolers running

...

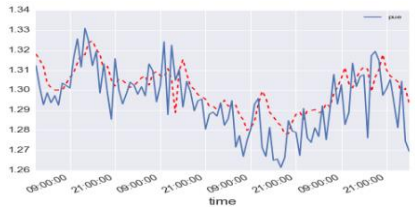
Given

Setpoints:

Ventilation fan
Chilled water temperature
IT power consumption
...

↓

Predict PUE



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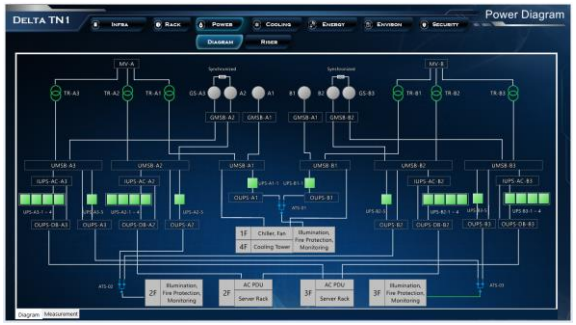
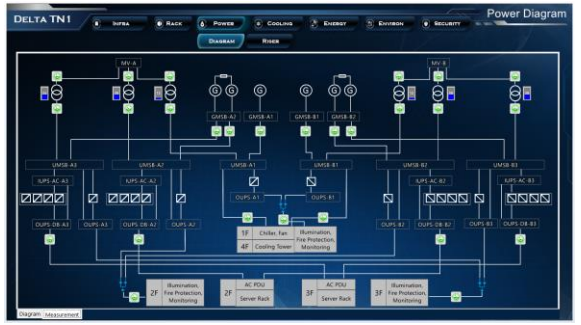
Power Management

Single line diagram

Show the SLD with power meter, breaker and component status

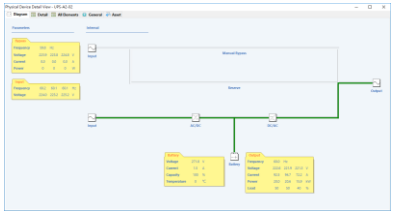




Power Equipment Monitoring

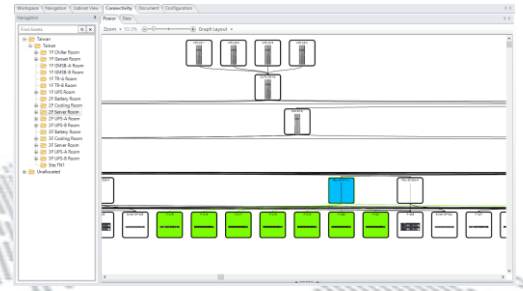
UPS, ATS, Genset, PDC, PDU, …

The device can be identified quickly from the layout plans



Power connectivity

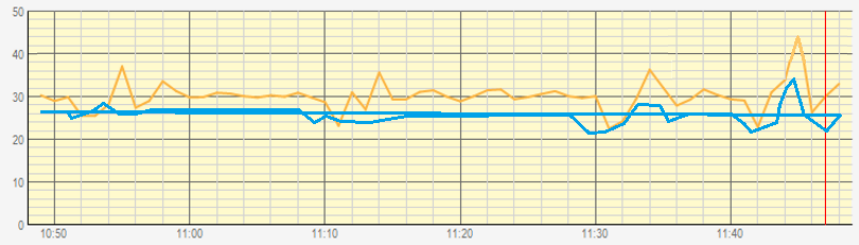
Failure impact analysis



Cooling Management

Cooling Loss Monitoring

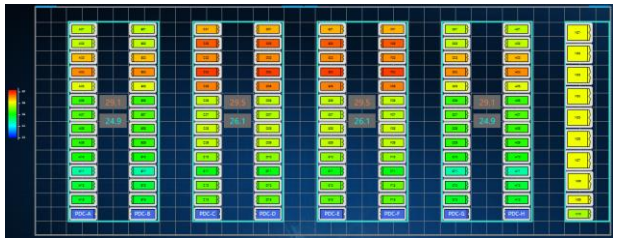
IT power consumption v.s. Cooling capacity



Identify the hot-spot

Rack load map

Thermal map



Airflow & Cooling Performance

RCI (Rack Cooling Index)

RTI (Return Temperature Index)

Rating	RCI
Ideal	100%
Good	≥ 96%
Acceptable	91 ~ 95%
Poor	≤ 90%

Rating	RTI
Target	100%
Recirculation	> 100%
Bypass	< 100%

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Security Management

Door Access Integration

- Card reader, access controller integration
- Door status detection
- Event log for door and ID information

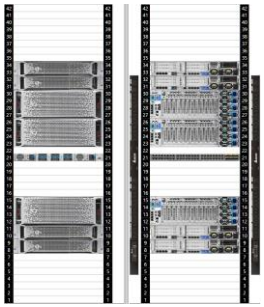
Surveillance

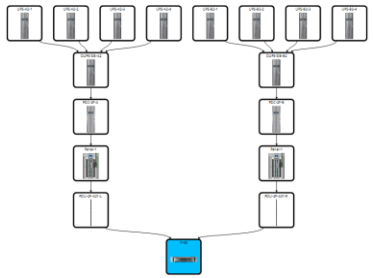
- Full time/ scheduling recording
- Event trigger recording
- Playback based on time and event

Rack Management

Rack Asset

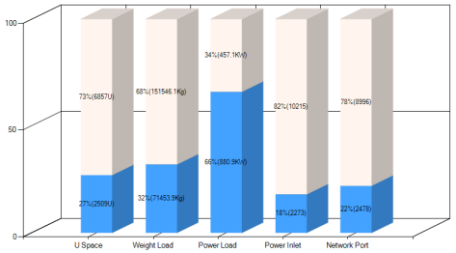
- Quickly search for server, network and power equipment
- Display detail rack content
- Power path backtracking
- Network connectivity

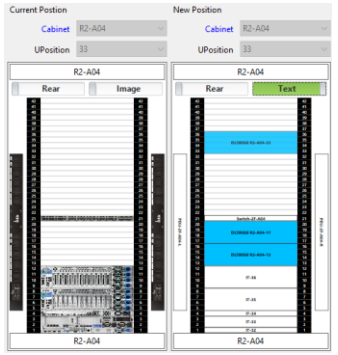




Rack Capacity

- Utilization of u-space, power, weight, network for room and rack
- Rule-based prediction for new asset plan
- Commit to workorder





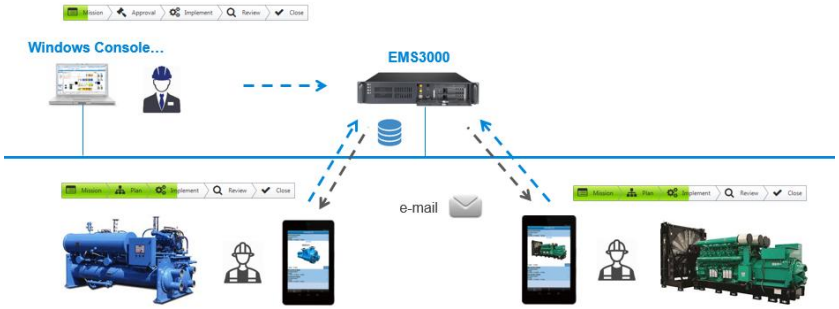
Process Management

Workorder

Scheduling for maintenance plan, onsite inspection

Event trigger for alarm elimination, prevention

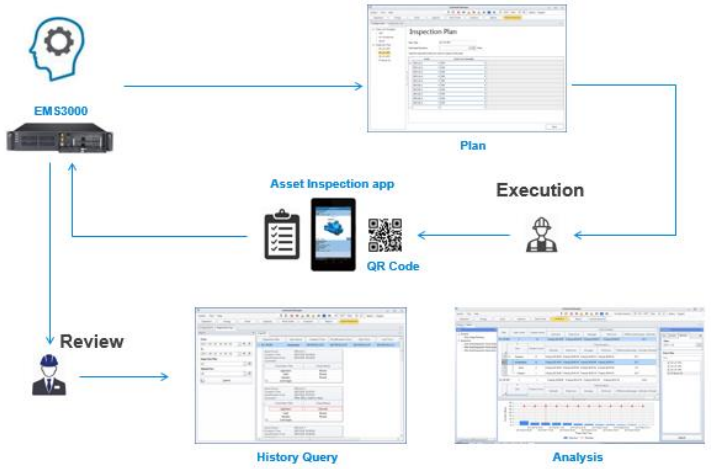
Problem report, record and execution platform



Asset Inspection

Reduce the asset inspection time

Follow the planned instructions by using the app



Best-in-Class Service

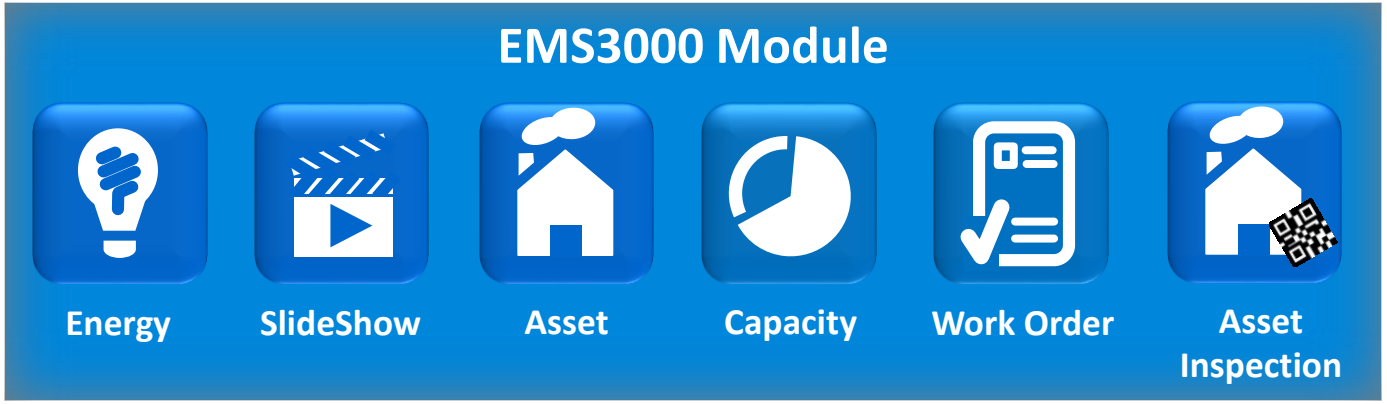
Design for Flexibility

Delicate Software Team

Professional Support & After Sales Service

Delta InfraSuite Manager – EMS3000

Operation



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