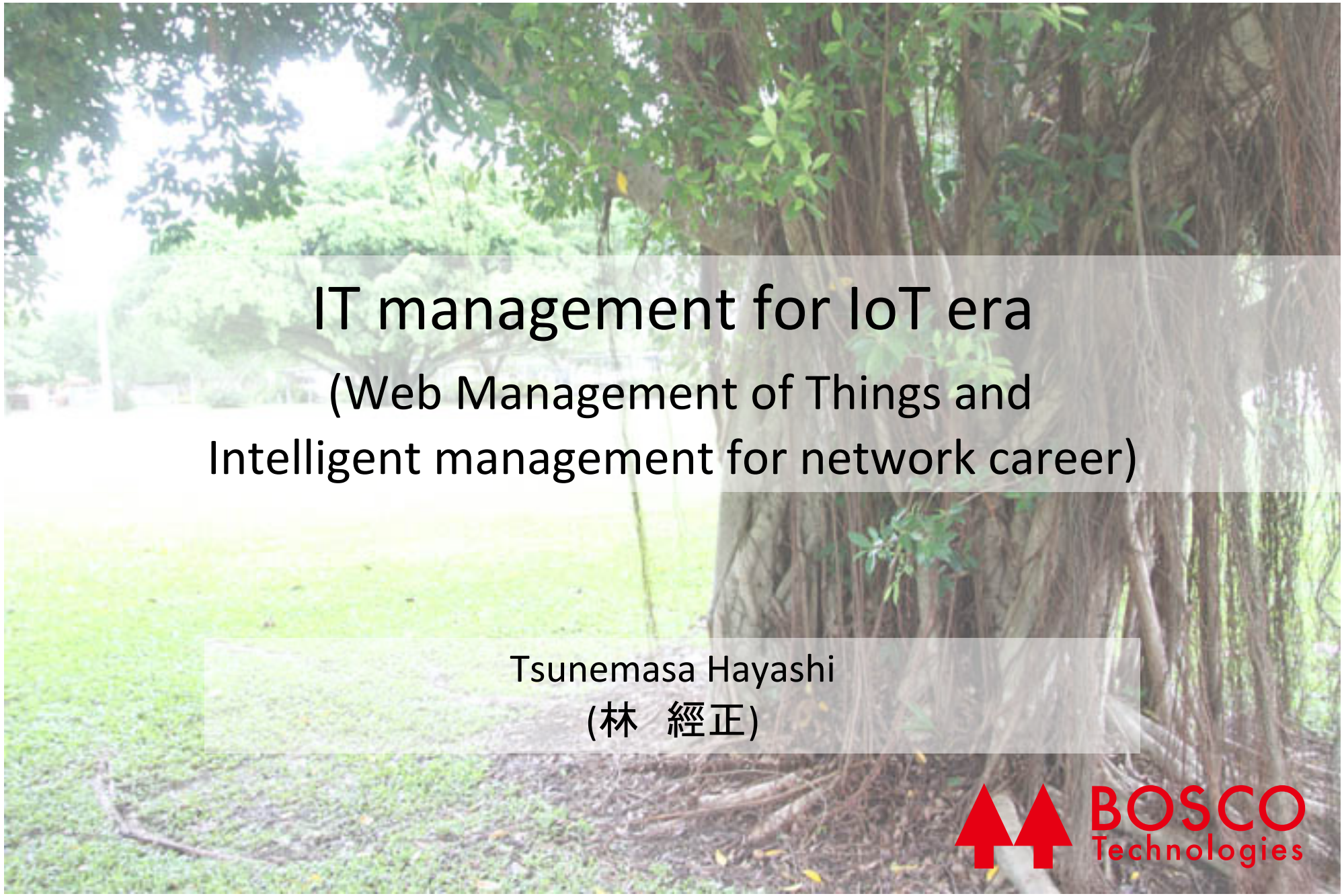

IT management for IoT era

(Web Management of Things and Intelligent management for network career)

Tsunemasa Hayashi
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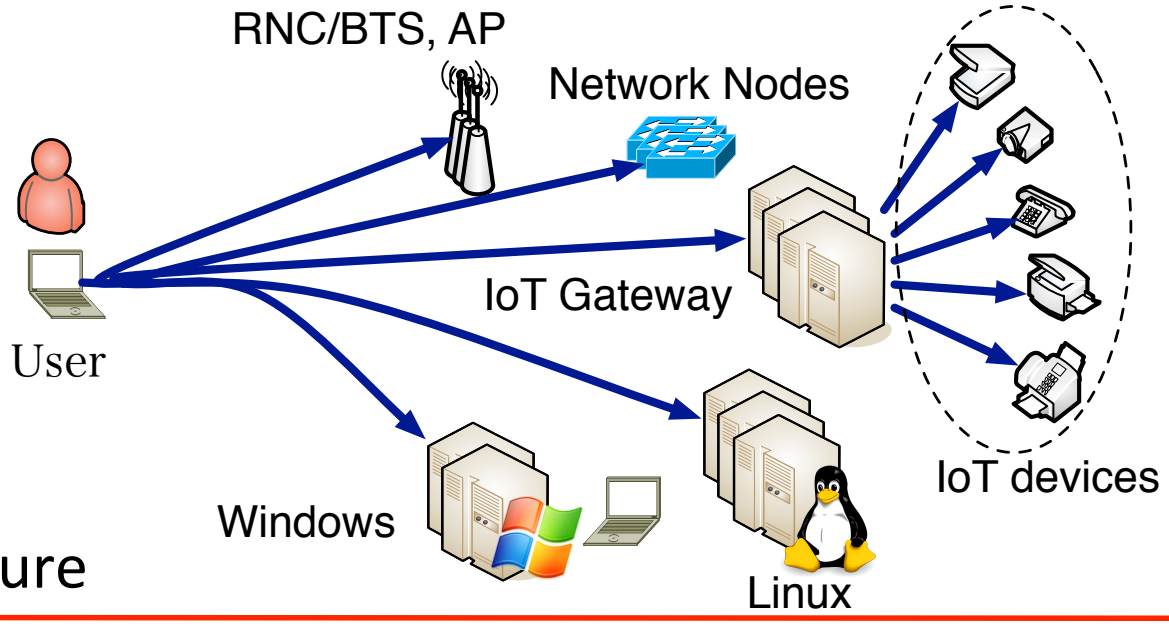
Outline

- Background (of IT management of IoT era)
- Today's topic: simple and easy
- How realize simple and easy management ?
- Target for simple and easy
- Example of new style of IT-management
- Demo an exmple

Background (of IT management of IoT era)

- Many services are deployed in IoT era
- Sophisticatedly manage hetero IC-infrastructure
- Decrease OPEX with gigantic hetero infrastructure
- How do we achieve low cost management ?
- "Simple and easy" for IT management



Gigantic
hetero infrastructure

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Today's topic

Why simple and easy ?

- Reduce operation service-time
  → handle much more management operation
- Reduce the number of miss operation
  → manage much more complicated IT-infrastructure
  → make much more sophisticated services

Target for IT management in IoT era

- Simplify user operation / connection to IT-infrastructure
- Absorb many differences between IT-infrastructure
- Realize many automation in IT management

Results of simple with SDN

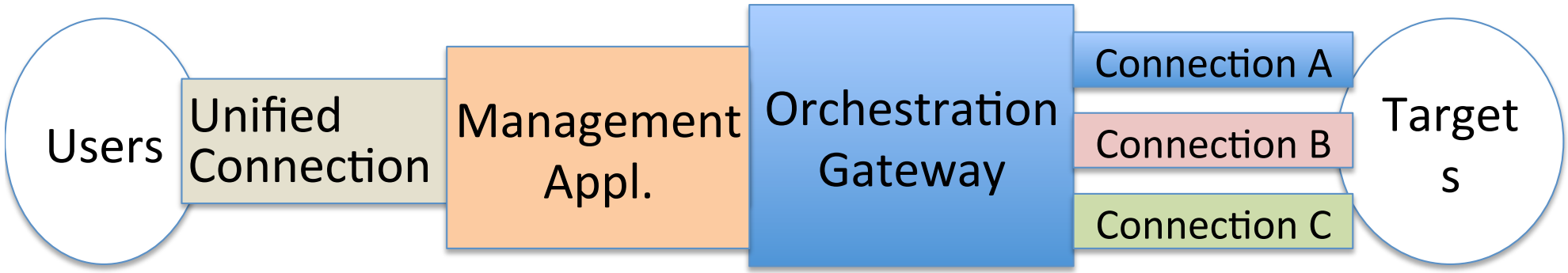
- Isolate logical and physical operations,
  and concentrate logical operation
  → simplify management of network services and can handle a bunch of customer's orders
  → accelerates automation in IT management
- APNOMS 2014' keynote speaker "Takashi Ooi" said
  - "We can save 50% OPEX" with SDN automation
- NTT Communications realizes network design automation
  1,000 service orders per month in 2012
  1,300 service orders per day in 2016

What is target for simple and easy ?

- Access operation to IT Infrastructure for user should be unified
- Management operation
  - independent from differences of IT infrastructure (many device and OS of IT infrastructure)
- Requires no-special client application
- Requires no-change on IT infrastructure

How realize simple and easy management ?

- Unified connection to IT-infrastructure for user
  → Every management through web browser
  (Web management of Things)
- Absorb differences between IT-Infrastructure
  - Absorb all connections between target equipment
- Make applications on the absorption “Orchestration Gateway”



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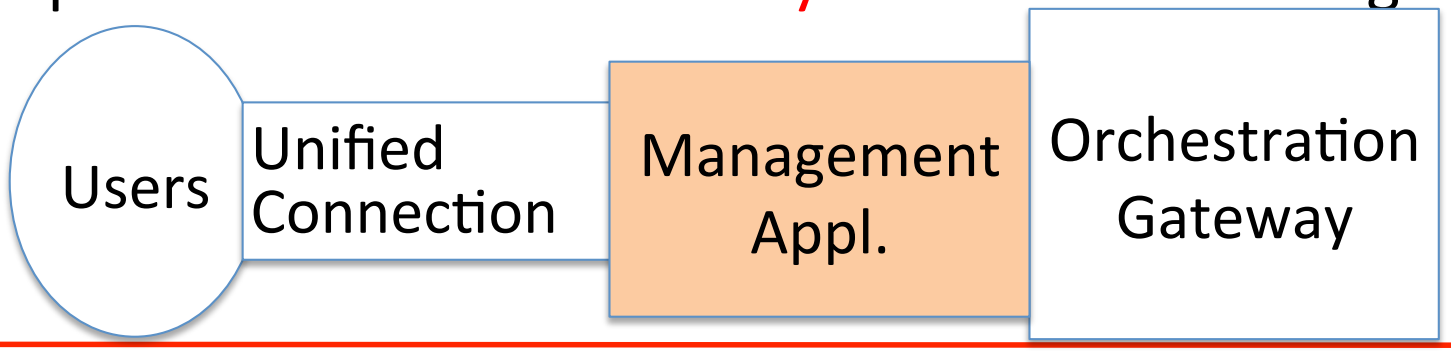
Management Application

- Simultaneously operates on many equipment
- Executable user-defined automated actions for routinized operation
- Simple and secure password management
- Traceable all operation on equipment
  - Replay and evaluation
- REST IF for all function on the Gateway
- Implement "SMART Gateway" as Orchestration gateway



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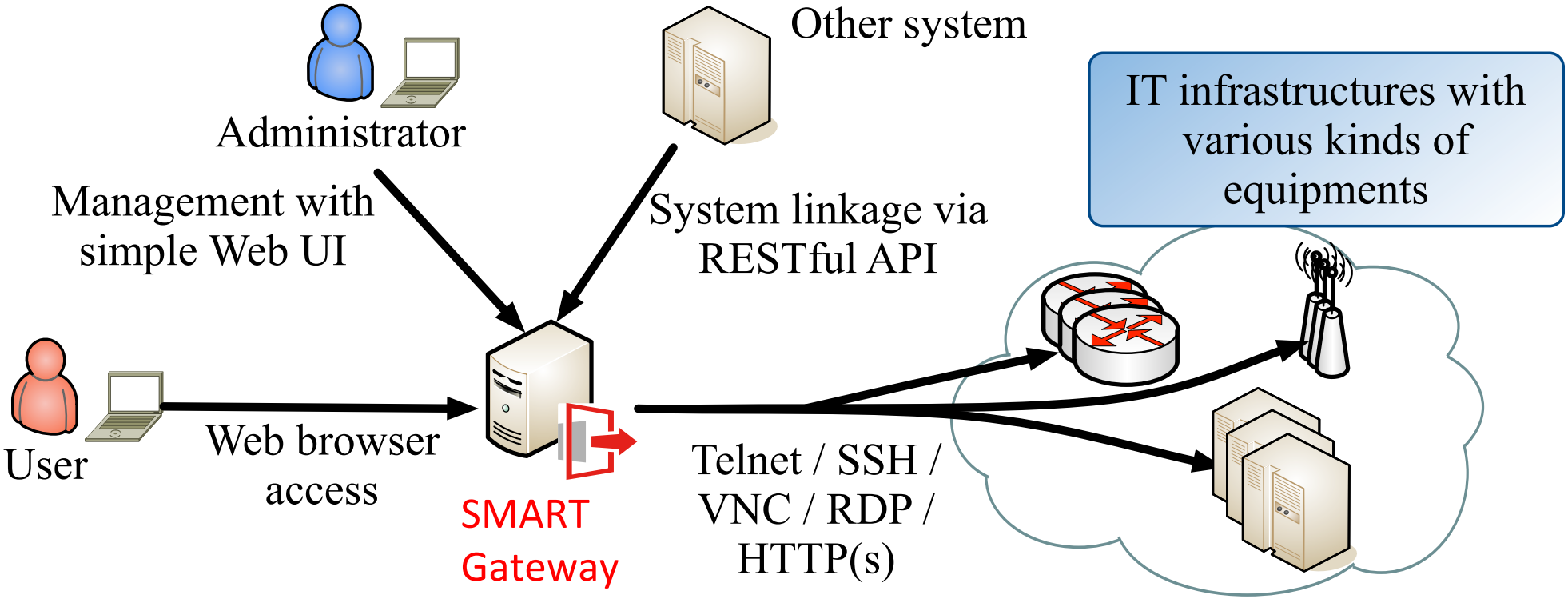
Supports many organizations

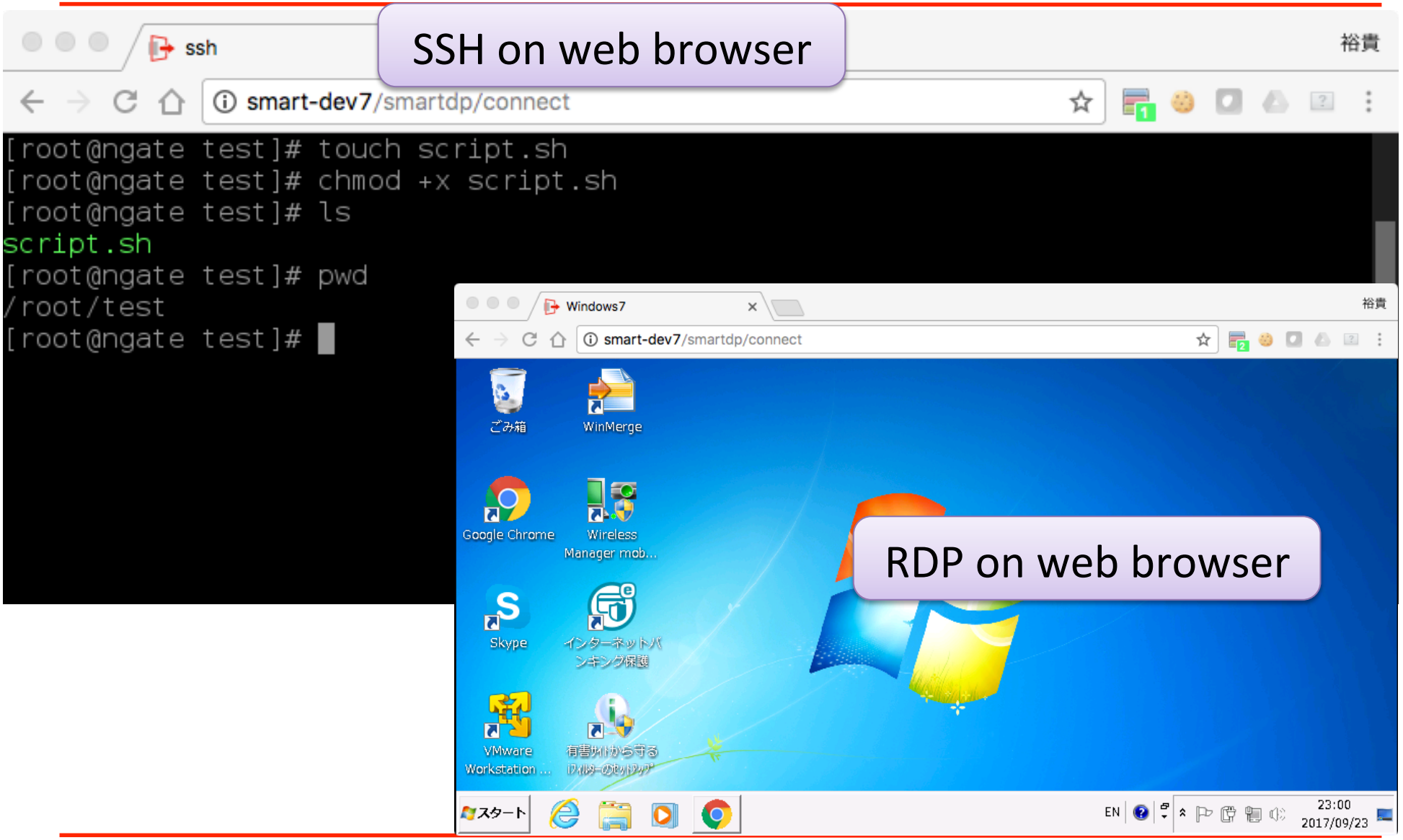
- Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
- Japan patent office (JPO)
- Setagaya city (Tokyo)
- NTT Communications, NTT east
- NTT Data, NTT
- KDDI, KDDI Research
- Mega banks in Japan
- Many service providers and SIers

SMART Gateway Demo system

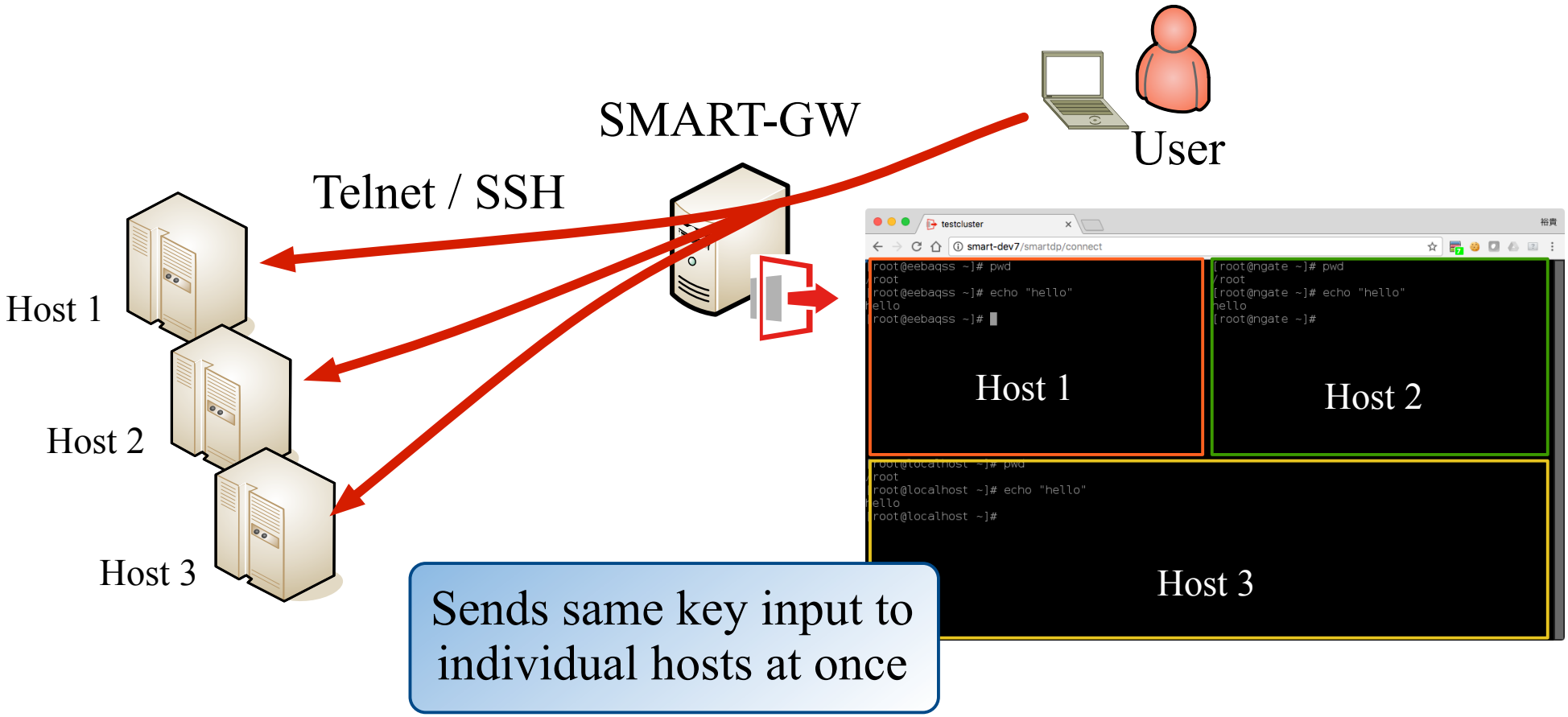
- All management operation is on Web
  → Web management of Things (WoT)



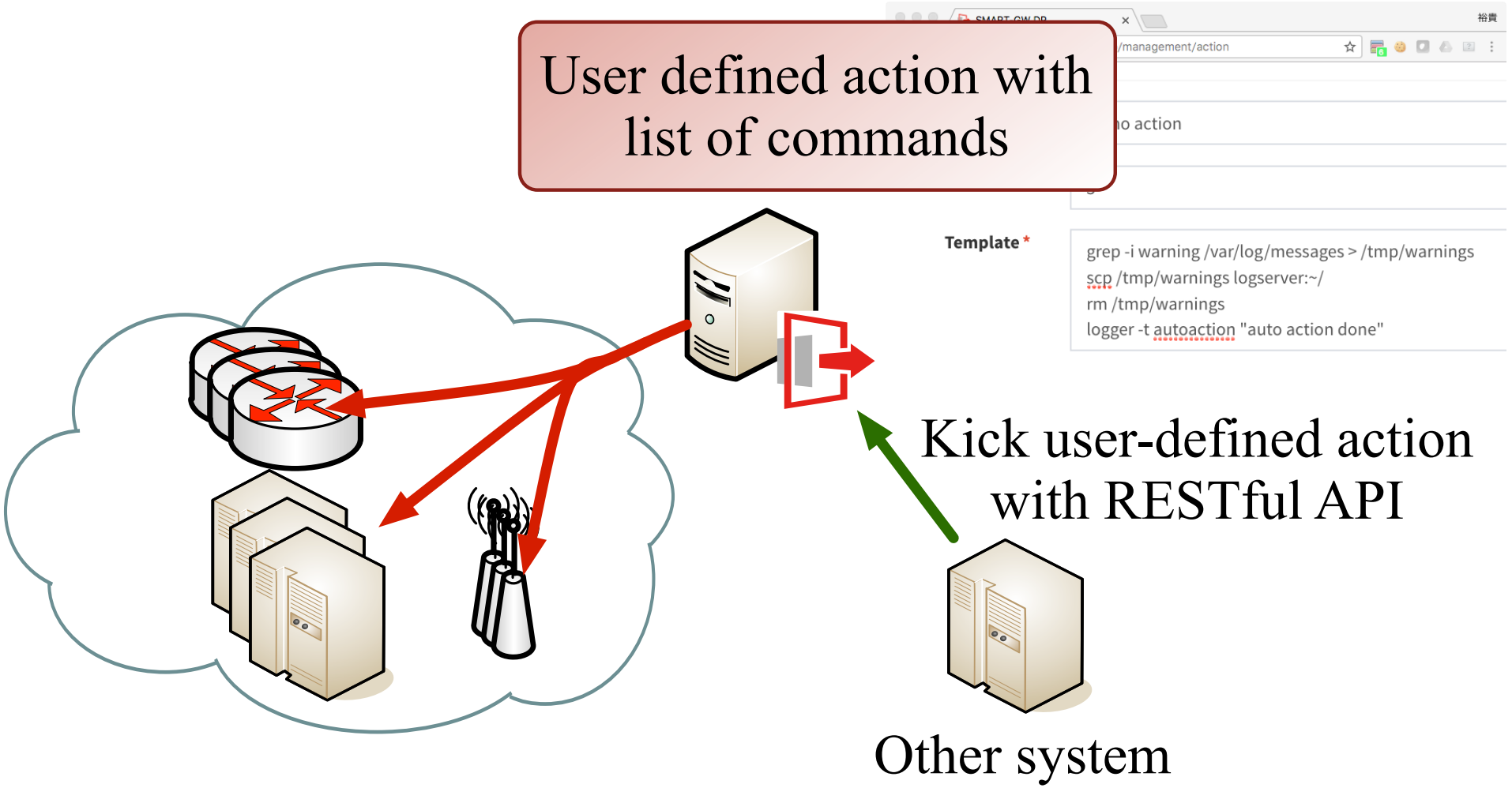
All connections on Web



Simultaneous operation



User-defined automated action



Traceable all operation on equipment

- Replayable SMART-Gateway log is utilized for a statement of delivery at NTT groups

NTT EAST

NTT Communications

```
root@uno2:~ — ssh uno2-tsune — 80×24
 * updates: ftp.tsukuba.wide.ad.jp
base                                                     | 3.7 kB     00:00
epel                                                     | 4.3 kB     00:00
epel/primary_db                                          | 5.9 MB     00:00
extras                                                   | 3.4 kB     00:00
updates                                                  | 3.4 kB     00:00
updates/primary_db                                       | 4.2 MB     00:00
Resolving Dependencies
There are unfinished transactions remaining. You might consider running yum-comp
lete-transaction first to finish them.
--> Running transaction check
---> Package kernel.x86_64 0:2.6.32-696.10.3.el6 will be installed
---> Package kernel-devel.x86_64 0:2.6.32-696.10.3.el6 will be installed
---> Package kernel-firmware.noarch 0:2.6.32-696.10.2.el6 will be updated
---> Package kernel-firmware.noarch 0:2.6.32-696.10.3.el6 will be an update
---> Package kernel-headers.x86_64 0:2.6.32-696.10.2.el6 will be updated
---> Package kernel-headers.x86_64 0:2.6.32-696.10.3.el6 will be an update
---> Package perf.x86_64 0:2.6.32-696.10.2.el6 will be updated
---> Package perf.x86_64 0:2.6.32-696.10.3.el6 will be an update
--> Finished Dependency Resolution
--> Running transaction check
---> Package kernel.x86_64 0:2.6.32-696.3.1.el6 will be erased
---> Package kernel-devel.x86_64 0:2.6.32-696.3.1.el6 will be erased
```

Demo

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Demo of Traceable all operation

- sgctl replay 18834e9cf52548d083590d9514c4b526
- sgctl replay 2bbc6eb7abef4fcf8ef9e734ccc108bf
- sgctl replay b5ca01cfbec6464e90ff0760f6806f39