

# SpringOS 1.5+ // 2012 July

知念

北陸先端科学技術大学院大学 高信頼ネットワークイノベーションセンター  
Dependable Network Innovation Center,  
Japan Advanced Institute of Science and Technology

# Facts

---

## Status

- Developing new features for "1.6"
- Do use it in operation.

## Recently Version

springos-v16pre-20120718.tar.gz

## Amount

- "wc" reports that 157000+ lines were included.
- "git diff" reports that 30000+ lines were changed until May, 2012.

# Topics

---

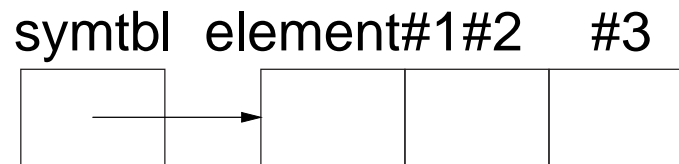
- array become 1st class
- interactive mode
  - ◇ upload/download and more
  - ◇ pickup/wipeout and more
  - ◇ nodeassign
- NSS fields (application protocol over HTTP for node configuration)
- various mapping
- reservation sub-system

# Array

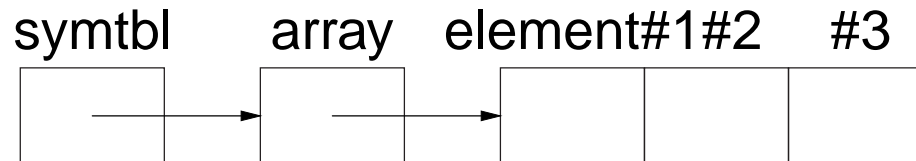
---

- array become 1st class
  - ◇ memory layout of array are changed also

**conventional:**



**modern:**



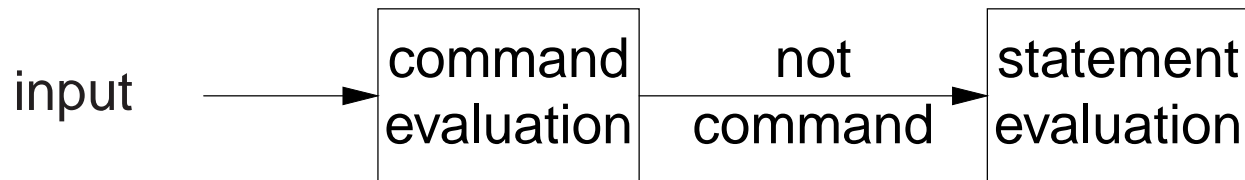
# Interactive Mode

---

accepts commands and statements.

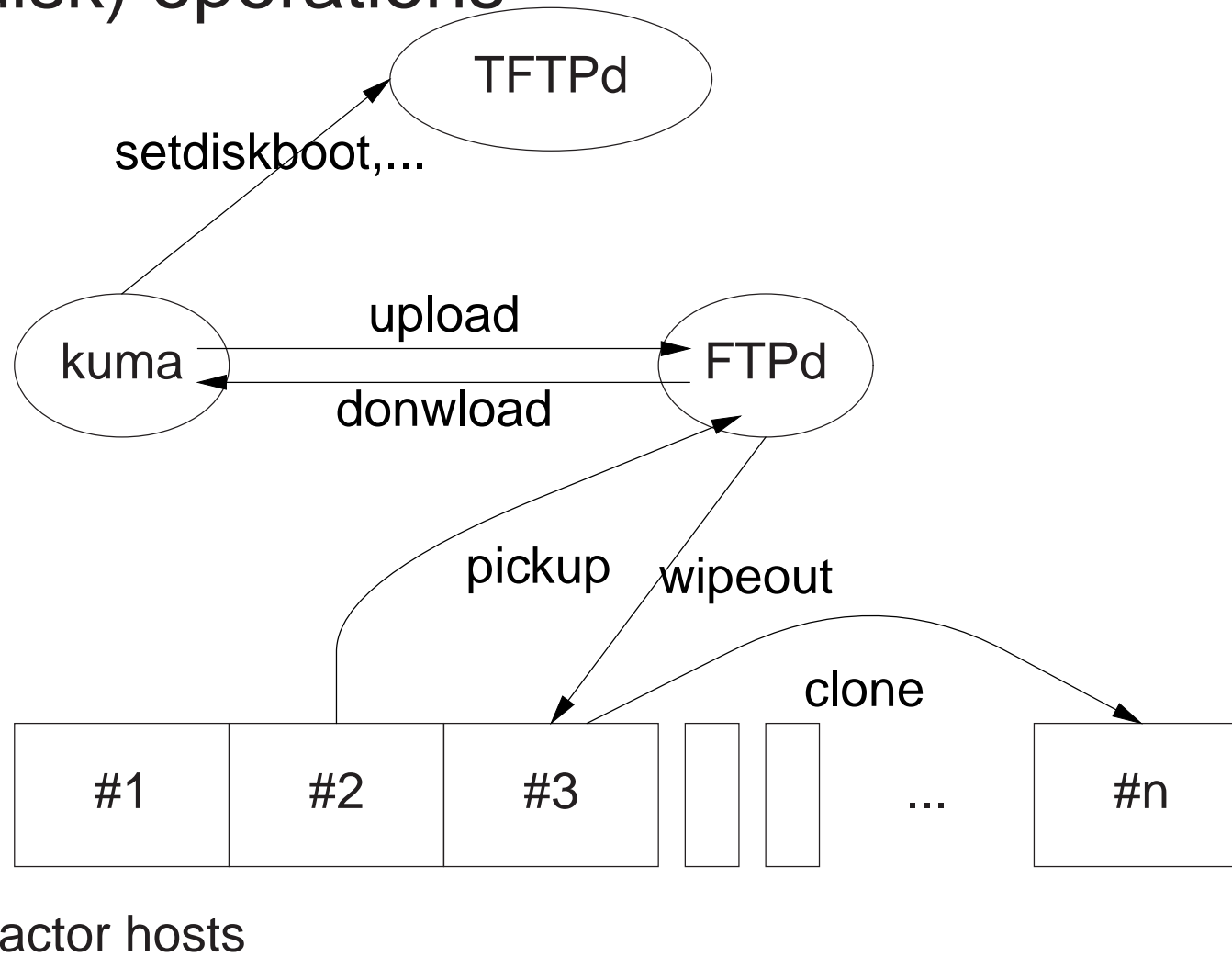
**Command:** — instead of `program-pickup` and `sbpsh`  
`load`, `run`, `pickup`, `wipeout`, `poweron`...

**Statement:** — traditional K language  
`nodeclass`, `nodeset`, `scenario`, `attach`, ...



**NOTES:** it is `-I` option of `kuma`, not `-i` option.

# File(disk) operations



# Other File Operation

---

	<i>local</i>	<i>remote</i>
pwd	lpwd	rpwd
cd	lcd	rcd
ls	lls	rls
rm	lrm	rrm

This version expects that the remote is FTP server.

## ”clone”

---

clone is a combination of pickup and wipeout.

```
clone a001:1 b001:1 b002:1
```

above is equal below.

```
pickup a001:1
```

```
wipeout $lastremote b001:1 b002:1
```

Here, \$lastremote is the filename of pickaped file.  
the recording of pickaped files is not required.



# RC-file

---

RC(run command)-file was read before prompt appearing.

The name of the file is `.spshrc` in default.

```
% kuma -I          # read RC-file
% kuma -I -a        # skip read RC-file
% kuma -I -A other  # read other file
```

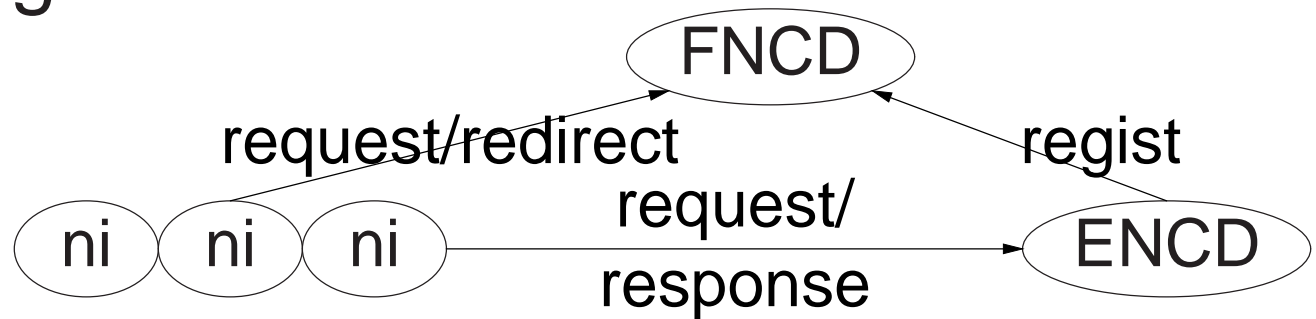
RC file accepts both commands and statements.

# NSS Fields

---

## NSS ?

NSS(Node Supervisor System) is a diskimage delivery system by Dr. Misumi. SpringOS was implemented according to that.



## Fields ?

In SpringOS, NSS is application protocol over HTTP. Node configuration is carried as HTTP contents. ENCD, NI and FNCP use the protocol.

This month I revise these fields.  
Old FNCP miss-understand them probably.

X-NSS-Version	<i>protocol version</i>
X-NSS-State	<i>request type</i>
X-NSS-Agent	<i>agent program and its version</i>
X-NSS-Agent-ID	<i>agent ID</i>
X-NSS-Driver	<i>driver program and its version</i>
X-NSS-Driver-ID	<i>driver ID</i>
X-NSS-Mission-ID	<i>mission (chunk of session) ID</i>
X-NSS-Session-ID	<i>session (file retrieval) ID</i>
X-NSS-Node-IPaddr	<i>IP address of node</i>
X-NSS-Redirect-Dest	<i>next server, destination</i>

# Various Mapping

---

## traditional:

```
for(i=0;i<2;i++) {  
    attach client[i].netif[0] en[0]  
}
```

## modern:

```
attach client[0..2].netif[0] en[0]
```

# Resource Assignment

---

Currently, user can assign node manually.  
However it tends to long.

## **traditional:**

```
client[0].agent.ipaddr = "172.16.1.1"  
client[1].agent.ipaddr = "172.16.1.2"  
client[2].agent.ipaddr = "172.16.1.3"
```

## **modern:**

```
nodeassign client "a1-3"
```

nodeassign express that explicitly and short.

## Resource Assignment (*cont.*)

---

for part of array...

```
nodeassign proxy[3] "c7"  
nodeassign server[1..2] "b1-3"[@1]
```

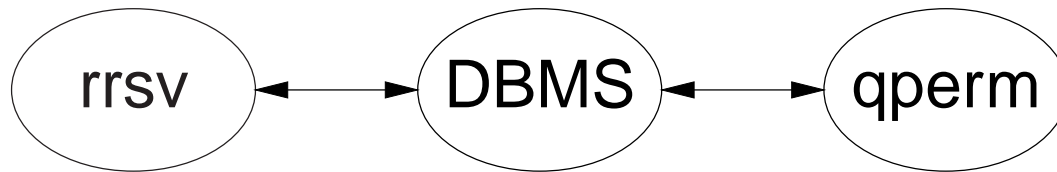
<i>node</i>	<i>host</i>
server[1]	"b1-3"[1] ⇒ "b2"
server[2]	"b1-3"[2] ⇒ "b3"

netassign is similar. assigns VLAN-ID.

```
netassign sales "73"  
netassign develpping "243"
```

# Reservation Sub-System

- A counter part of pperm



- implemented by PHP
- (right)top page snapshot
- Trial operation starts on Murubushi
- **rrsv** is stored into "contrib"-directory

The screenshot shows a web browser window with the URL <http://150.65.179.151/cont-www/rsv.php>. The page title is "Resource Reservation". It features a navigation bar with "File", "Edit", "View", "History", "Bookmarks", "Tools", and "Help". Below the navigation bar, there are "Redraw" and "Reset" buttons, followed by two date input fields containing "20120719" and "20120730". A light blue box contains an "Account" dropdown menu set to "chinen" and a "Password" input field. To the right of the password field are "List-base" and "Plot-base" buttons. Below this is a calendar for July 2012, with days 19 through 30. The days of the week are abbreviated as T, F, S, S, M, T, W, T, F, S, S, M. Two vertical purple bars highlight the 21st and 28th. At the bottom, a list of experiment IDs (exppc001 to exppc010 and exnnrd011) is shown, each with a corresponding row of small circles indicating reservation status.

# Reservation Main Page

File Edit View History Bookmarks Tools Help

Navigation Plot-base Back

## List-base Reservation

#	ID	User	Project	Date/Time	Resource
1	2	<input type="checkbox"/> chinen	yoko	20120711 20120722	exppc002-005
2	3	<input type="checkbox"/> chinen	yoko	20120711 20120722	vlan0100-0200
3	4	N/A	N/A	20120711 20120712	exppc001-001
4	5	<input type="checkbox"/> chinen	yoko	20120711 20120722	exppc006-010

Del

Add chinen yoko

ex) 20121231-20130105 exppc003-012; vlan007-023

Redraw Reset

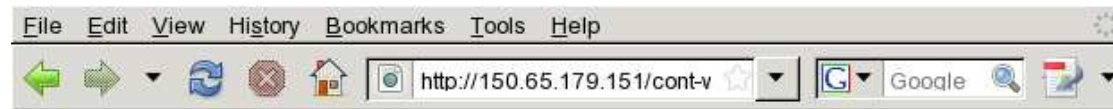
Find:  Previous Next Highlight all Match case

Done

- Listing
  - ◇ other users items are masked
- Add
  - ◇ range expression
  - ◇ use "VLAN" for VLAN items
- Delete



# Reservation; User Registration



## User Registration Page for SpringOS

Welcome. Fill following cells and push "submit" button.

Account:	<input type="text"/> ex) taro <i>Alphabets and numbers within 8 letters.</i>
Username:	<input type="text"/> ex) Taro Yamada <i>Within 32 letters.</i>
E-mail address:	<input type="text"/> ex) info@starbed.org <i>It is used in confirmation of this registration. You should input valid address. We do not recommend free e-mail address. Within 32 letters.</i>
<input type="button" value="submit"/>	



- The sub-system has user registration feature
- It send e-mail message with initial password

# Future and Discussion

---

- save, save the script and parameters
- logical name based commands

```
clone "a001":1 client:1 server:1
```

- mapping keyword "all"

```
nodeassign client[all] "a1-10"[@1]
```

- parallel diskimage deriver
- uploading to TFTP server (or DMAN)
- collaboration to special handmade DHCPd

Optional Pages...

# If Possible ...

---

- Driving experiment over multiple facility
  - ◇ multiple management server sets
  - ◇ namespace of resource
- Partition table base disk operation
  - ◇ `ni` works according to OS memorized table
  - ◇ direct access to table makes the operation for hidden area.

## Array (again)

---

No name array is available.

```
print array(1, 2, 3)[2]
```

In previous version, array must be bound to name.  
This may useful C-extension like...

```
b = new integer[5]
```

But, `new` operator is strange because K always makes memory areas for every entities.  
So K applies `new` everytime.

# Mapping (again)

---

```
client[0..2].netif[0..1]
```



```
client[0].netif[0]  
client[0].netif[1]  
client[1].netif[0]  
client[1].netif[1]  
client[2].netif[0]  
client[2].netif[1]
```

## Mapping (again) (cont.)

---

`client[0..2].netif[0..1] server[@1]`



<code>client[0].netif[0]</code>	<code>server[0]</code>
<code>client[0].netif[1]</code>	<code>server[0]</code>
<code>client[1].netif[0]</code>	<code>server[1]</code>
<code>client[1].netif[1]</code>	<code>server[1]</code>
<code>client[2].netif[0]</code>	<code>server[2]</code>
<code>client[2].netif[1]</code>	<code>server[2]</code>

## Mapping (again) (cont.)

---

```
client[0..2].netif[0..1]  server[@1]  proxy[@2]
```



client[0].netif[0]	server[0]	proxy[0]
client[0].netif[1]	server[0]	proxy[1]
client[1].netif[0]	server[1]	proxy[0]
client[1].netif[1]	server[1]	proxy[1]
client[2].netif[0]	server[2]	proxy[0]
client[2].netif[1]	server[2]	proxy[1]



## RC-file (again)

---

For upper compatibility, reading of rc-file for past program is available.

```
_importpickupopt "pickup.opt"  
_importsbpshrc ".sbpshrc"
```

However, new kuma coverage is larger than that of those programs.

You should append more several lines to generated configuration.