

Taiwan Government's Initiative to Increase IPv6 Deployment

IPv6 UP

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- **Introduction**
- **Vision, Strategy, and Actions**
- **Roadmap and Budget**
- **Execution Steps**
- **Conclusion**

- IPv4 address exhaustion
 - The IANA IPv4 address exhaustion happened on 3, Feb. 2011.
 - APNIC reached the IPv4 final /8 stage on April 15. 2011
- IPv6 adoption at critical phase
 - In this phase, it is important to do IPv6 transition and development for internet stakeholders.

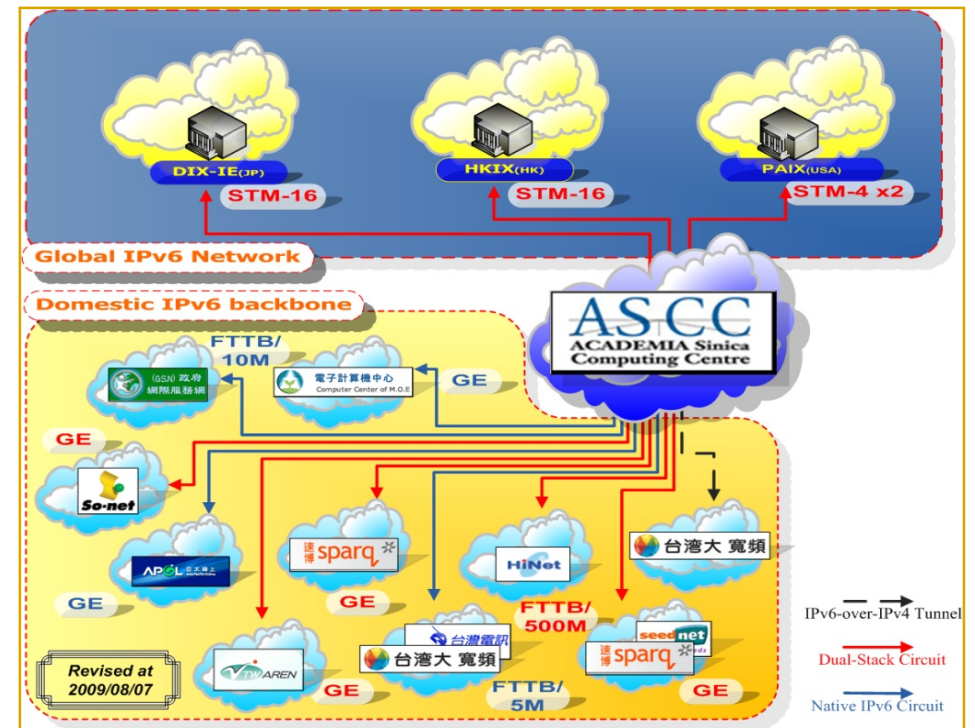
Taiwan ISPs IPv6 Current Status

● Infrastructure

- 10 ISPs had depolyed IPv6 backbone.
- IPv6 IX – ASNet Internet eXchange v6 (ASIX6)

● Access

- Chung-Hwa Telecom(HiNet) NGN (FTTX) provides IPv4 and IPv6 dual services since 2011.
- IPv6 Tunnel Services are provided in most ISPs (HiNet, Sparq, SONET, APOL, TFN) since 2007.



TANet(Taiwan Academic Network) IPv6

Network Deployment

- Fully scaled deployment of primary and high schools at 2010
 - 95% of schools provide IPv4/IPv6 dual stack access, IPv6 accessibility of WWW, DNS, SMTP
 - 68% of classes provide IPv4/IPv6 dual stack VoIP service



Taiwan IPv6 Readiness Survey

- Measure the status of IPv6 deployment in Taiwan since 2009

- <http://v6readiness.ipv6.org.tw/>
- <http://v6directory.twnic.net.tw>

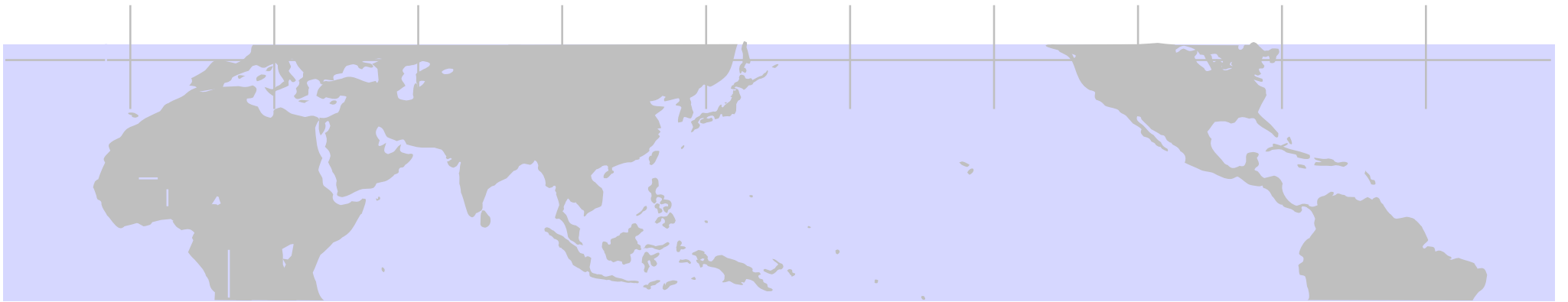
Users	<ul style="list-style-type: none"> • Web query from IPv6 • DNS query from IPv6
Applications	<ul style="list-style-type: none"> • IPv6 servers in Web, and DNS
Access Network	<ul style="list-style-type: none"> • Traffic in IPv6 Tunnel Broker
Core Network	<ul style="list-style-type: none"> • Number of ISPs within IPv6 allocations that are advertised in BGP • IPv6 traffic that in/out of Taiwan

IPv6 Readiness Items	Aug-10	Aug-11	Growth
International IPv6 Traffic (Mbps)	32.9	110.5	336%
IPv6 Server	922	8,294	900%
IPv6 Websites	716	7,341	1,025%
IPv6 / IPv4 DNS Query Ratio	0.46%	0.91%	198%

Vendors	<ul style="list-style-type: none"> • IPv6 Ready Logo Phase I & Phase II
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Source: Taiwan Network Information Center (TWNIC)



IPv6 UP (IPv6 Upgrade Promotion Program)

Taiwan Government's Initiative to
Transit to IPv6

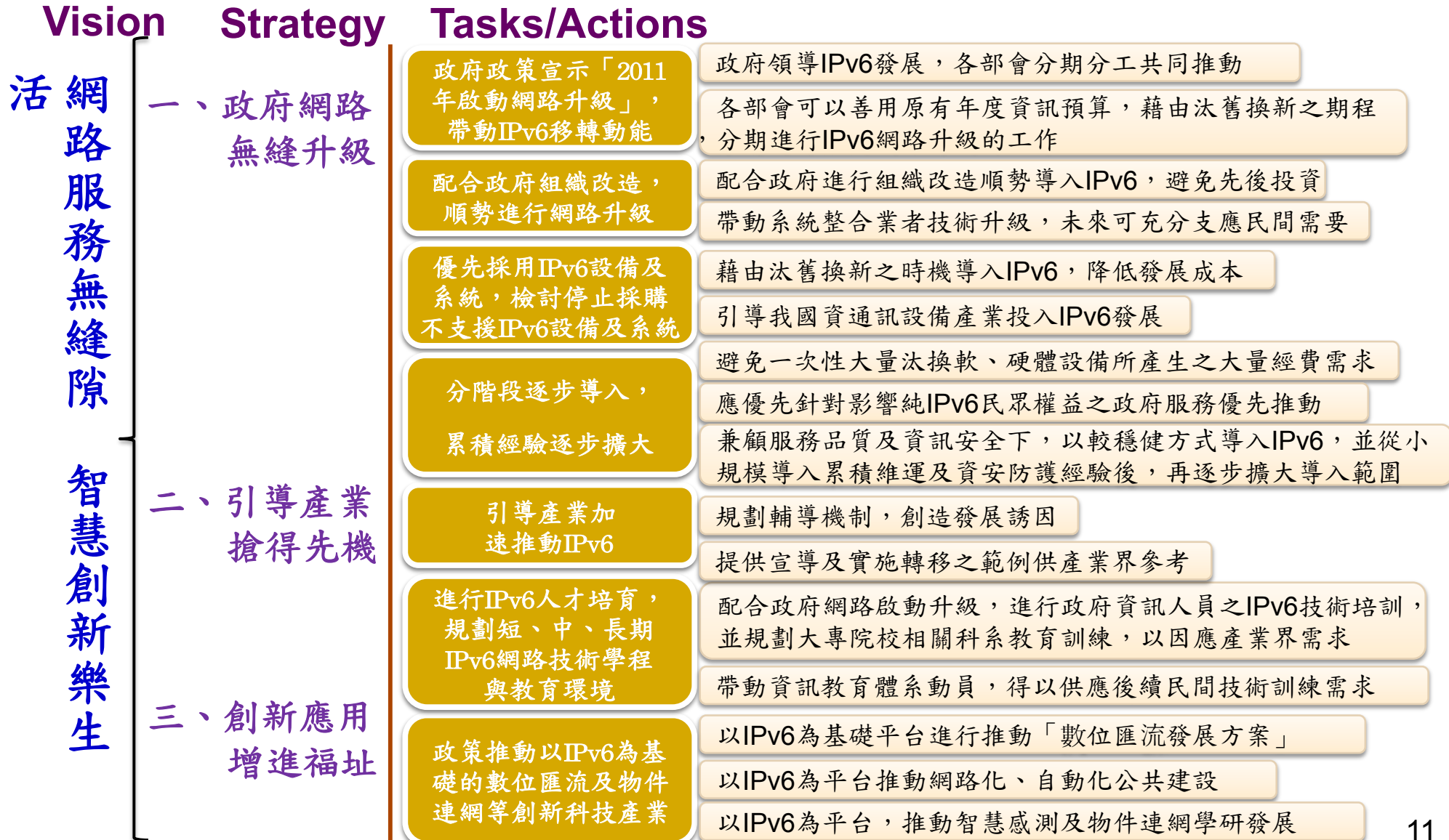
- Vision
 - Seamless network service (seamless transition to IPv6)
 - Innovative and intelligent network applications (IPv6)
- Strategies
 - Seamlessly update Government Service Network (GSN) to IPv6
 - Promote information and communication industry to enable IPv6 feature
 - Promote innovative and intelligent IPv6 applications

Actions

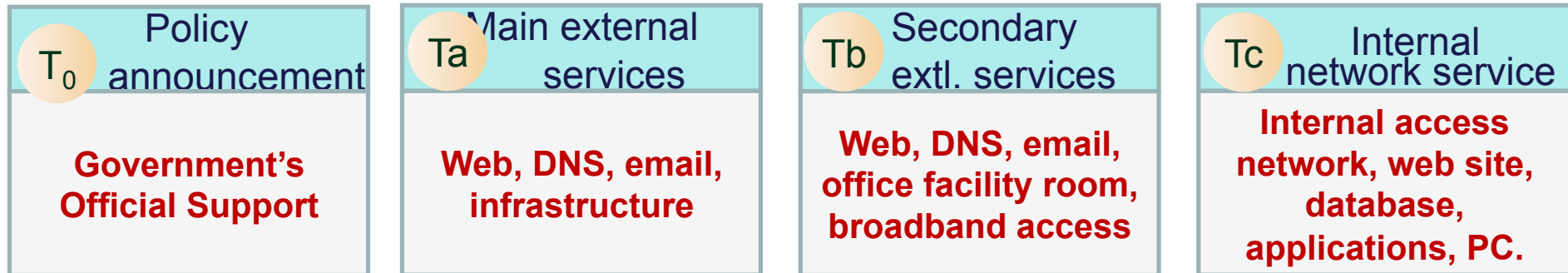
- Seamlessly update GSN to IPv6
 - Announce government policy on kicking off IPv6 network
 - Upgrade GSN to IPv6 ready network
 - Give priority to the use of IPv6 equipment and systems
 - Phased deployment, gain experience and gradually expand

- Promote information and communication industry to enable IPv6 feature
 - Guide the industry to accelerate IPv6
 - Provide IPv6 personnel training
- Promote innovative and intelligent IPv6 applications
 - Promote digital convergence based on IPv6
 - Promote public network and automation services based on IPv6
 - Promote IPv6-based intelligent sensors and Internet of things research projects

Vision, Strategy, and Actions



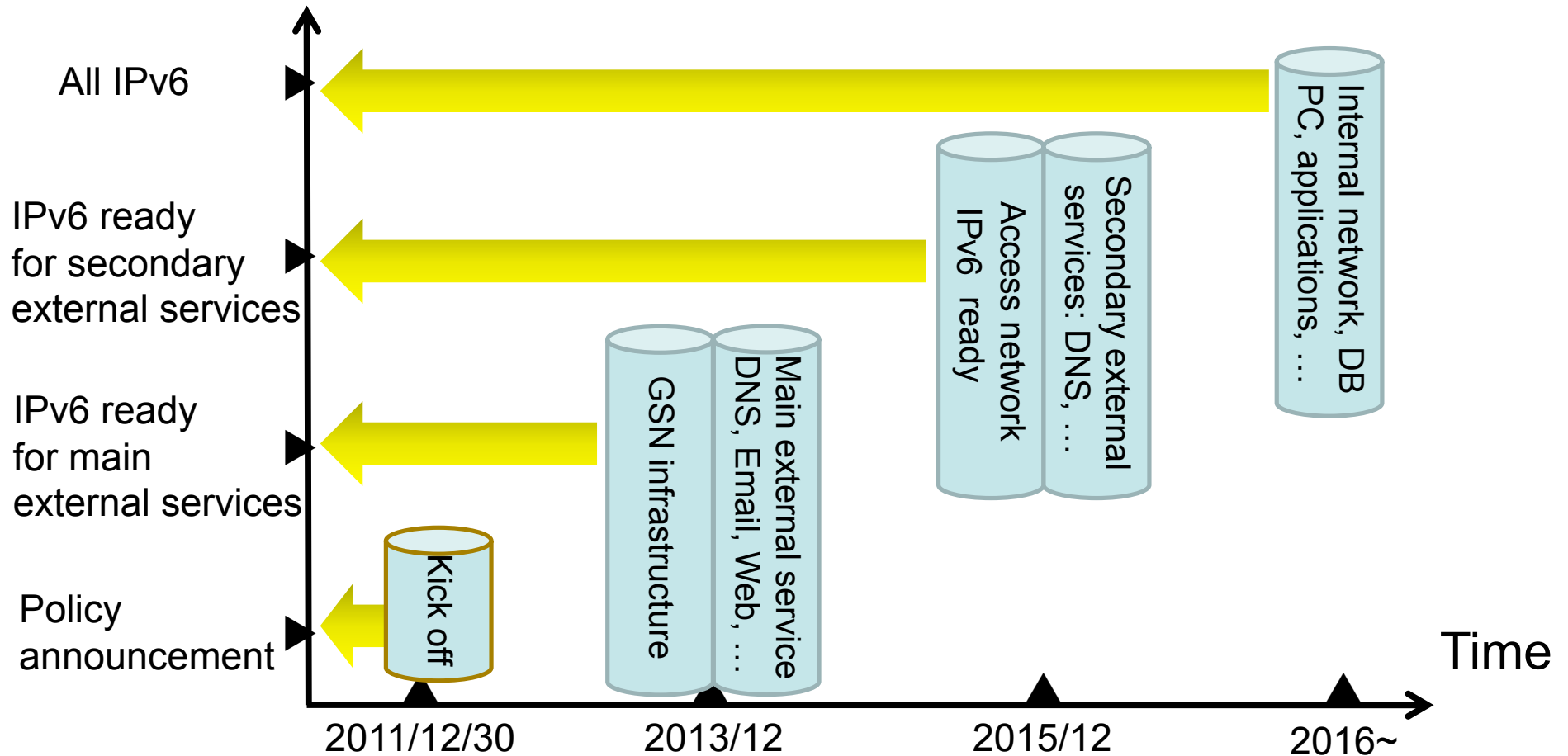
Roadmap



item	time	remark
T ₀	2011/12/30	necessary
T _a	2013/12/31	necessary
T _b	2015/12/31	necessary
T _c	2016~	adjustable based on budget

Roadmap

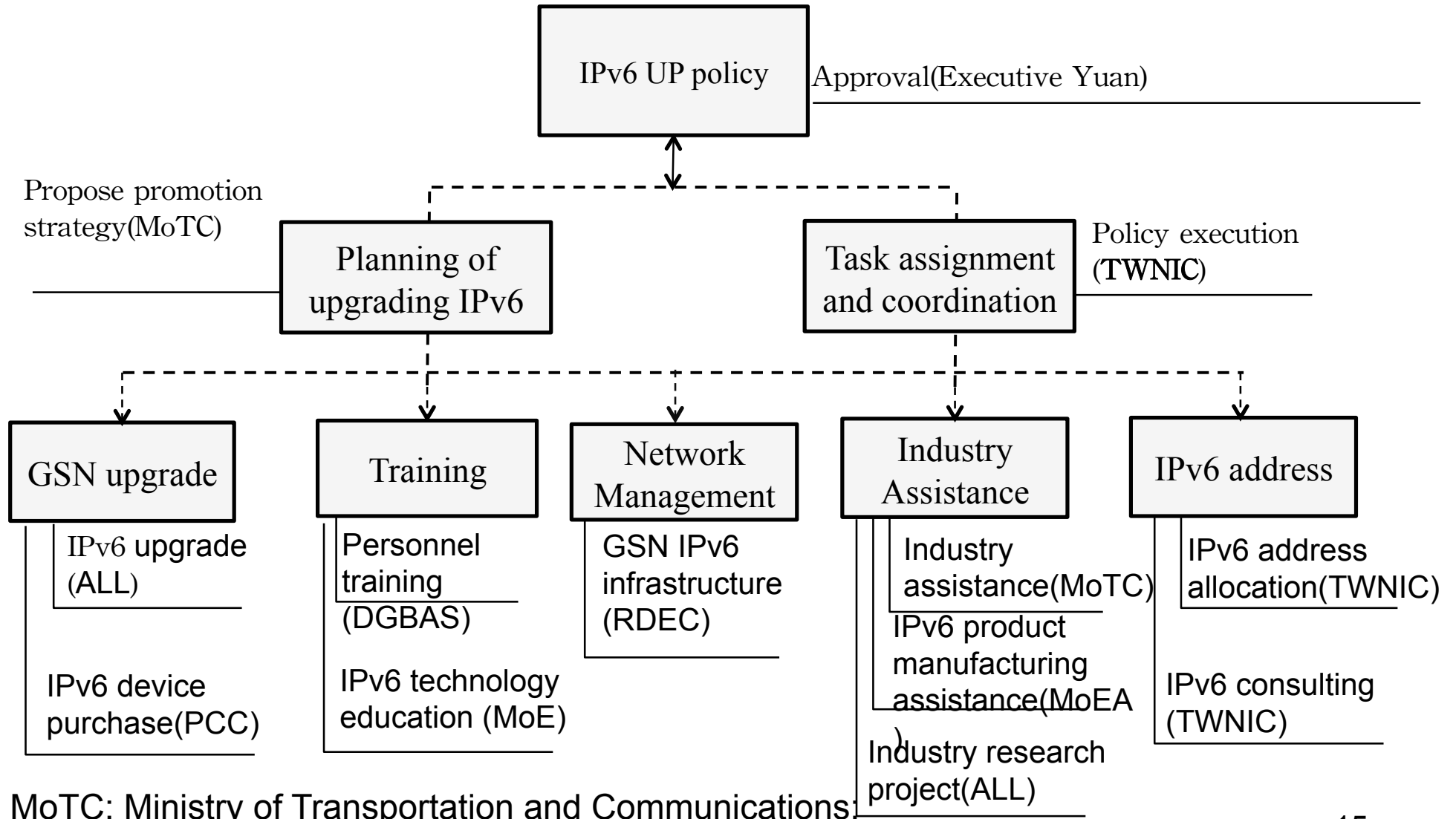
IPv6 status



Budget

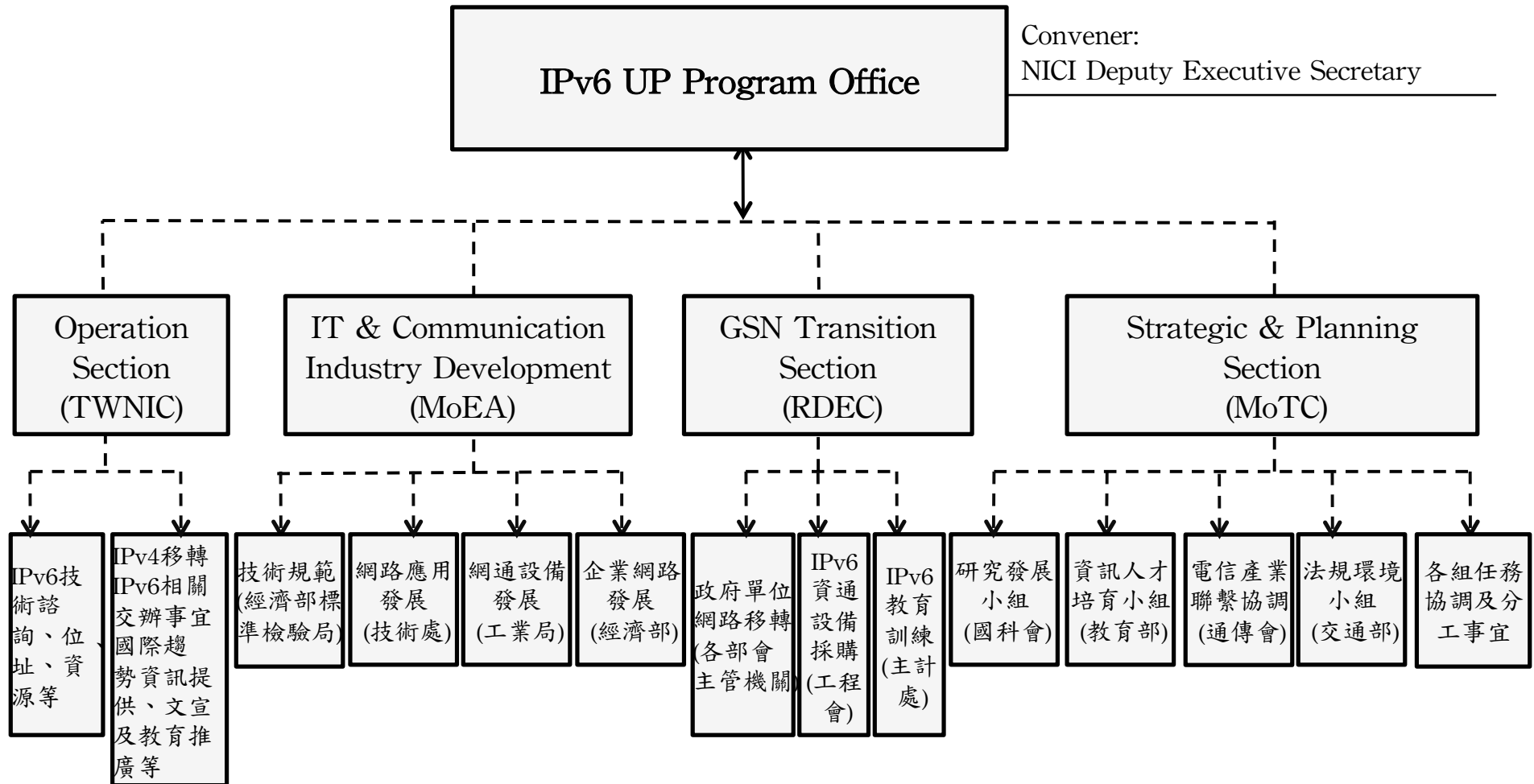
- Estimated based on other country's experience/estimation
- Total budget is NT\$ 2.2 billions
 - ~ 0.75 billion US dollars
 - ~ NT\$ 0.4 billions per year for 6 years
 - Basically, not additional budget.

Promotion Task Architecture



MoTC: Ministry of Transportation and Communications
 MoEA: Ministry of Economic Affairs

Structure of the Promotion Office



工作項目	1	2	3	4	5	6	7	8	9	10	11	12
A.各部會												
1.指定推動IPv6 單位與主管	■											
2.清查尚未支援IPv6的軟、硬體，提出分期升級之規劃清單		■	■	■								
3.提出IPv6設備與軟體採購清單			■	■	■	■	■					
4.進行第一階段網路升級							■	■	■	■	■	■
B.交通部												
1.訂定政府採購IPv6資通設備與軟體規範		■	■									
2.研擬IPv6產業輔導機制		■	■	■	■	■	■					
3.研擬以IPv6為基礎的新興視訊數位匯流研究計畫		■	■	■	■	■	■					
4.相關計畫之推動							■	■	■	■	■	■
C.行政院研考會												
1.提出GSN各縣市機房及IPv6接取線路供裝時程		■	■									
2.協助評估政府網站服務分期升級IPv6清單			■	■	■	■	■					
3.修訂政府網站建置及營運作業參考指引			■	■	■	■	■					
4.相關計畫之推動							■	■	■	■	■	■

Schedule (2/3)

工作項目	1	2	3	4	5	6	7	8	9	10	11	12
D. 行政院主計處												
1. 研擬政府單位資訊人員IPv6教育訓練計畫		■										
2. 完成各部會資訊人員IPv6教育訓練			■	■	■	■						
3. 相關計畫之推動							■	■	■	■	■	■
E. 行政院公程會												
1. 普查共同供應契約之資通設備是否符合支援IPv6規格		■	■	■								
2. 辦理相關IPv6標準之網通設備、系統軟體等採購法令釋疑				■	■	■	■	■	■	■	■	■
F. 教育部												
1. 將IPv6的發展需要納入網路通訊人才培育先導型計畫進行規劃		■	■	■	■	■						
2. 規劃短、中、長期IPv6技術教育訓練課程							■	■	■	■	■	■
G. 國科會												
1. 盤點既有執行中或即將推動之學術研究發展計畫				■	■	■	■	■	■	■	■	■

工作項目	1	2	3	4	5	6	7	8	9	10	11	12
H.經濟部												
1.盤點既有執行中或即將推動之科專計畫		█										
2.規劃網路內容升級IPv6及網路創新應用發展之推動方案							█					
3.規劃IPv6設備產業發展之推動方案							█					
4.評估建立我國IPv6認證產品標章之需要							█					
5.規劃企業網路啟動IPv6升級之輔導措施							█					
I.其他相關部會												
1.盤點執行中或即將推動之網路化、自動化公共建設案			█									

- **Common tasks**

- **2012/1** : each division/office assigns head of the promotion task
- **2012/3** : inventory (stocktaking) of hardware/software that does not support IPv6 within each division/office
- **2012/3** : propose schedule of upgrading to IPv6 service
- **2012/6** : propose IPv6 upgrade plan proposal
- **2013-2014** : Finish phase 1 upgrade
- **2015-2016** : Finish phase 2 upgrade

- Ministry of Transportation
 - **2012/2** : Propose specification for government procurement of IPv6 hardware/software
 - **2012/6** : Propose IPv6 Industry guidance mechanism
- Research, Development, and Evaluation Commission
 - **2012/2** : Propose schedule for providing county's GSN IPv6 hosting service and access link
 - **2012/6** : Providing guidance for upgrading procedure
- Directorate General of Budget, Accounting and Statistics
 - **2012/2** : Propose IPv6 training plan
 - **2012/6** : Provide IPv6 training in batches

- Public Construction Commission
 - **2012/3** : investigate IPv6 capability of IT and communication equipment in common supply contract
 - **2012/12** : Handle doubts on procurement of IPv6 equipment and software systems
- Ministry of Education
 - **2012/6** : Adopt IPv6 training into the network and communications personnel training pilot project
 - **2012/12** : Planning short, medium and long-term IPv6 technology education and training courses

- Ministry of Economic Affairs
 - **2012/6** : inventory of ongoing projects, assessment the possibility of including IPv6 support
 - **2012/12** : Department of Industrial Technology takes responsibility on planning IPv6 network application development promotion program
 - **2012/12** : Industrial Development Bureau takes responsibility on planning IPv6 equipment manufacturing promoting program
 - **2012/12** : Ministry of Economic Affairs Bureau of Standards assessing the development of IPv6-related national standards
 - **2012/12** : MoEA plans counseling mechanisms for upgrading corporate networks to IPv6

- National Science Council
 - **2012/12** : inventory of IPv6 related research projects and plan to call for projects on IPv6 applications
- Other departments
 - **2012/6** : Assessment of upgrading existing networking and automation system to IPv6

- Every government agency must
 - ❑ Designate an IPv6 Transition Manager by Jan. 31, 2012.
 - ❑ Finish detail stocktaking of infrastructure and application related devices by Mar. 31, 2012.
 - ❑ All the government IT staffs take IPv6 training course by Jun. 31, 2012.
 - ❑ Finish the list of proposed procurement for IPv6 transition by Jun. 31, 2012.
 - ❑ Upgrade 50% public network service (Web, DNS, Email) to be dual stack enabled by Dec. 31, 2013. (Necessary)
 - ❑ Upgrade the other 50% public network service to be dual stack enabled by Dec. 31, 2015. (Necessary)
 - ❑ Upgrade the internal network by Dec. 31, 2016. (Suggestion)

Conclusion

- “IPv6 UP” Program is not only preparing, but also doing actual Taiwan Government IPv6 transition.
- It will also help ISPs, ICPs, SIs, training units, software developers, equipment vendors to be ready for the upcoming transition of commercial units.