



# Planning an IPv6 Rollout

A Few Lessons from the Trenches

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**Denver**

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## A Word from Captain Obvious

*Any network change project imposes risks.*

**New technology**

A blue upward-pointing arrow with a white outline and a slight 3D effect.

**RISK**

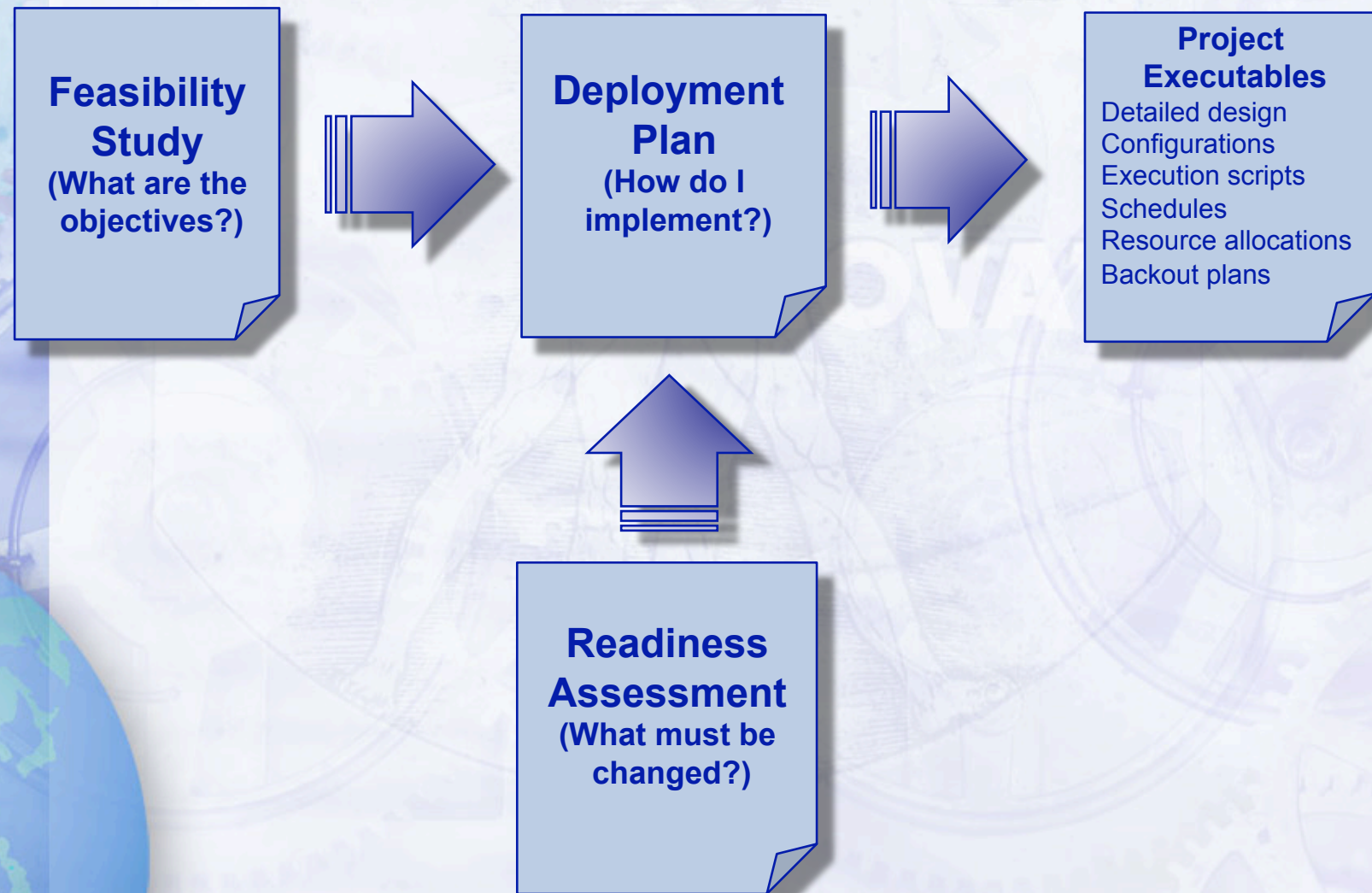
**Comprehensive planning**

A blue downward-pointing arrow with a white outline and a slight 3D effect.

**RISK**



# Best Laid Plans



# Remembrance of Plans Past

- It always takes longer than you expect
- Its always more complicated than you expect
- It makes no sense to deploy anything if you cannot manage it!
- It makes no sense to deploy anything if you cannot secure it!

When You Go For Funding...

**IPv6  
is an infrastructure issue,  
not a service issue**



# Address Design

- Short Term: IPv6 addresses are new to people
  - Give them time
  - Design for your operations personnel
  - Have a plan to inform them
- The first address plan is seldom the last address plan
  - Keep address design flexible throughout planning stage
- Long Term: IPv6 addresses will be *easier*
  - If the design is done right
  - If the format makes sense

# It Sucks That We Can't Dual Stack Everything

- Good plan 10 years ago
  - Dual stack everything (plenty of IPv4 addresses)
  - Quietly decommission IPv4
- Not enough IPv4 addresses left to do this
- Tunneling, NAT-PT, ALGs are a necessary evil
- But, will accelerate full adoption of IPv6
  - Can't go back
  - Complicated transitional networks drive move to simplicity
  - How to simplify? Get rid of IPv4!



# DNS: Name That Tune

- Poor DNS planning is behind many IPv6 “failures”
- Issues are well documented
  - RFC 3596
  - RFC 3901
  - RFC 4074
  - RFC 4472
- Issues to consider:
  - Transport
  - Dedicated vs dual stack resolvers
  - Name space fragmentation
  - Placement (NAT-PT, DNS ALGs, load balancers)
  - Applications
  - Bad implementations



# Tunneling: You Can't Get There from Here

- Latency problems usually caused by tunnels
- Know where your tunnel endpoints are
- Distant 6to4 relays
- Broken Teredo servers

# Don't Buy Vaporware

- A salesperson's job is to sell
  - (Captain Obvious strikes again)
- "Supports IPv6" is meaningless
- Be specific about what a product / interface must support
  - Back to thorough planning
- Sometimes roadmaps must be accepted
  - But you *must* understand the risks



# Testing 1... 2... 3...

- Vendors depend on field experience to mature new code
- IPv4 assumptions cannot apply to IPv6!
- Production deployment is not the time to find:
  - Compliance problems
  - Interoperability problems
  - Functional, performance, or security bugs

# IPv6 Best Practices

- There ain't none
  - (Well, not very many)

**If you're deploying IPv6  
now, you're creating the  
best practices**

**(Don't be scared!)**




# Train Thyself

- IPv6 books are okay, but...
- Network!
  - NANOG
  - Cisco Networkers
  - IETF
  - You're here, aren't you?

**[www.rmv6tf.org](http://www.rmv6tf.org)**

# Questions?

I will use Google before asking dumb questions. I will use Google before asking dumb questions. I will use Google before asking dumb questions. I will use Google before asking dumb questions. www.mrburns.nl before asking dumb questions. I will use Google before asking dumb questions. I will use Google before asking dumb questions. I will use Google before asking dumb questions. I will use Google before asking dumb questions. I will use Google before asking dumb questions. I will use Google before asking dumb questions. I will use Google before asking dumb questions. I will use Google before asking dumb questions.

A cartoon illustration of Bart Simpson's head and shoulders. He has his signature yellow skin, spiky hair, and a red shirt. He is looking towards the left with a slightly skeptical or weary expression, his eyes half-closed. The background behind him is dark green, matching the overall theme of the slide.



The background of the slide features a complex, artistic composition. It includes several interlocking gears of various sizes, some rendered in a light blue/white color and others in a vibrant green. A stylized globe is visible in the lower-left quadrant. The overall color palette is dominated by shades of blue and green, with a semi-transparent dark blue horizontal band across the middle where the text is located.

# Thank You!

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