

# ISATAP – Intra-Site Automatic Tunnel Addressing Protocol

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# ISATAP Overview

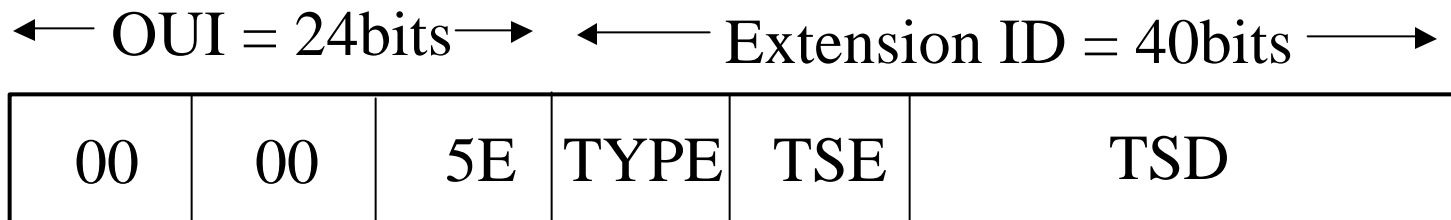
- Connects isolated nodes within IPv4 sites via automatic IPv6-in-IPv4 tunnels
- IPv6 globally aggregatable unicast address format with embedded IPv4 address
- ISATAP gateway auto-discovery mechanism for isolated nodes
- Automatically yields to native IPv6 addresses as transition progresses
- Backwards compatibility for IPv6-only nodes

# ISATAP Address Format

- RFC 2373 compliant IPv6 globally aggregatable unicast address
- IPv4 address inside EUI-64 interface identifier
- Uses IANA OUI assignment (00-00-5E)
- Construction rules:
  - special “TYPE” for embedded IPv4 addresses
  - preserves legacy EUI-48 IANA assignments
  - allows maximal future expansion

# ISATAP Address Format

EUI-64 Format Interface Identifier (bytes 8-15)



- If TYPE = 0xFF and TSE = 0xFE, TSD contains legacy EUI48 (TSE = 0xFF reserved by IEEE)
- If TYPE = 0xFE, TSE and TSD together contain embedded IPv4 address (V4ADDR)

# ISATAP Address Format

- Example:
  - V4ADDR is: 140.173.129.3
  - Routing prefix is 3FFE:1A05:510:2412
  - V6V4ADDR is:  
3FFE:1A05:510:2412:0:5EFE:140.173.129.3
  - Link-local variant is:  
FE80::0:5EFE:140.173.129.3

# Changes Since IETF-50 (Reported at IPv6 Interim)

- Name changed to ISATAP
- Added “Terminology” section
- Require ISATAP/non-ISATAP addresses use different /64 prefixes – simplifies sending rules
- Changed u/l bit in EUI-64 interface ID to indicate LOCAL scope

# ISATAP-only Prefixes

- Former approach mixed ISATAP/non-ISATAP addresses within the same /64 prefix – sending rules complicated
- New idea (Rich Draves et al.): use distinct /64 prefixes for ISATAP/non-ISATAP:
  - sending rules simplified
  - address selection considerations simplified

# Developments Since IPv6 Interim

- Linux implementation by Nathan Lutchansky:
  - works with all kernel versions 2.2.16 – 2.4.6 (with/without USAGI)
  - testing with stateful configuration complete
  - multiple interface support (anticipated configuration scenario for NAT)
  - code for stateless auto-configuration complete; testing begins after IETF51
  - Stay tuned for code release announcements (TBD with Nathan)



# Open Issues Since IPv6 Interim

- When to deprecate ISATAP address?
  - **Old answer:** when native IPv6 Rtdv's heard
  - **New answer:** when native Rtdv's heard AND ISATAP interface usage drops below some threshold
  - **Not conclusive;** more study needed
- Will ISATAP addresses be preferred over native IPv6 addresses by longest prefix-match?
  - No – destination ordering will fix this (already addressed in source/destination selection draft)

# Open Issues Since IPv6 Interim

- Will ISATAP present any new security issues?  
(question from private e-mail)
  - IPv6 source address spoofing seems like biggest issue
  - Nearly finished enumerating cases; spoofing easy to detect in all cases examined thus far
  - Claim: ISATAP secure IFF site's IPv4 network secure
  - Will send analysis to mailing list when complete
- Current draft expires 17 November 2001; new draft coming soon