Understanding NFPA 72: "Class N" Ethernet Infrastructure

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Important Items of Focus

Public Address solutions within the built environment are necessary systems to communicate with the building occupants; whether for general communication needs or crisis intervention.

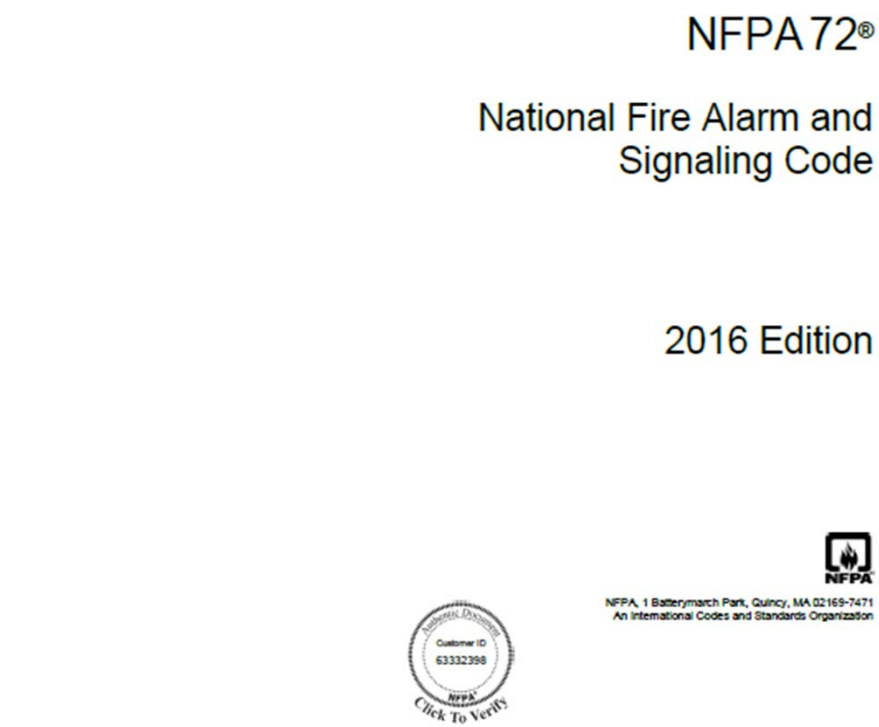
Important Items of Focus

When speaking of paging

- Is it a High Reliability Solution?
- Is it a Distributed Architecture?
- Is it a scalable product solution?
- Does it have the opportunity for integration?
- Is it EN-54 certified?
- Is it capable of supporting the voice communication needs of:

NFPA 72 – 2016 Emergency Communication System

Important Items of Focus



- 377 pages
- 827 changes
- Still just a guideline

NFPA-72 2016 Key Changes

Class N Infrastructure

"Perhaps the most significant changes to the Code pertain to wiring. The 2016 edition adds Class N, which addresses **internet** infrastructures for alarm and signaling systems; pathway performance and installation criteria are provided."

This also impacts the UFC 4-021-01

NFPA-72 2016 Key Changes

Chapter 10- Fundamentals

10.5.3.4 Means of Qualification. Qualified personnel shall include, but not be limited to, one or more of the following:

(1)*Personnel who are factory trained and certified for the specific type and brand of system being serviced

(2)*Personnel who are certified by a nationally recognized certification organization acceptable to the authority having jurisdiction

NFPA-72 2016 Key Changes

The NFPA 72 now defines three critical terms every ECS must address:

- Audibility
- Intelligible
- Intelligibility

NFPA-72 2016 Key Changes

Audibility requires the alarm tone to be 15dB above any ambient noise — but only the alarm tone, not voice messaging.

NFPA-72 2016 Key Changes

Intelligible is the ability to understand the directions.

As required by the NFPA code, messaging must make sense to everyone in the space, and signage — either active or passive — must be used to clearly indicate the escape route or location of refuge.

NFPA-72 2016 Key Changes

Intelligibility is the acoustic measurement of a space to provide the optimal environment for hearing the system's voice messages. The code requires an average Sound Transmission Index of .5 for the entire space. This means in large spaces with hard reflective surfaces, acoustic technologies, such as steerable arrays, must be employed to increase the speech intelligibility of the ECS.

NFPA-72 2016 Key Changes

Subjective versus Objective

- Audible- Objective as it is measurable
- Intelligible- Subjective and situation specific
- Intelligibility- Thought to be Objective but the code now allows a Subjective analysis.

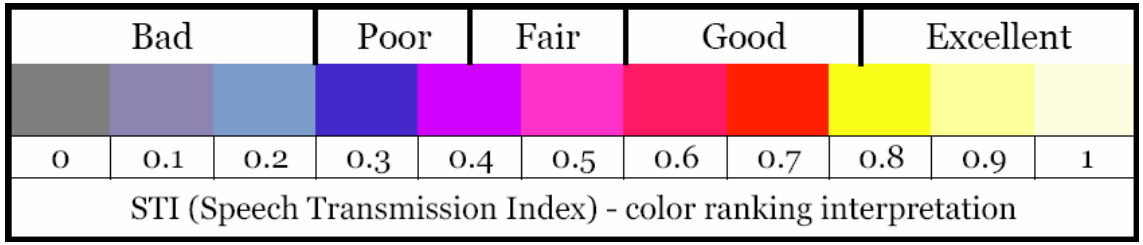
The design must be Objective, the commissioning MAY be Subjective

Speech Transmission Index

Decimal scale from 0 – 1 quantifies speech intelligibility

0 = not intelligible

1 = perfectly intelligible `



NFPA-72 2016 Key Changes

Message Templates

"Warning messages should provide information to the occupants on the state of the emergency and what they are supposed to do in response to this emergency. The warning message should come after an alert signal is given and can be provided via visual or audible means."

NFPA-72 2016 Key Changes

Message Templates

"Attention [floors 9, 10, and 11]. This is your [Building Safety Officer, Joe Smith]. A fire has been reported on the 10th floor of the building. Everyone on the [9th, 10th, and 11th floors] should move to the [8th floor] to be protected from heat and smoke, since heat and smoke can creep into nearby floors during a fire. Use the stairs immediately. Do not use the elevators. Those who need help getting to the 8th floor, please wait inside the stairwell."

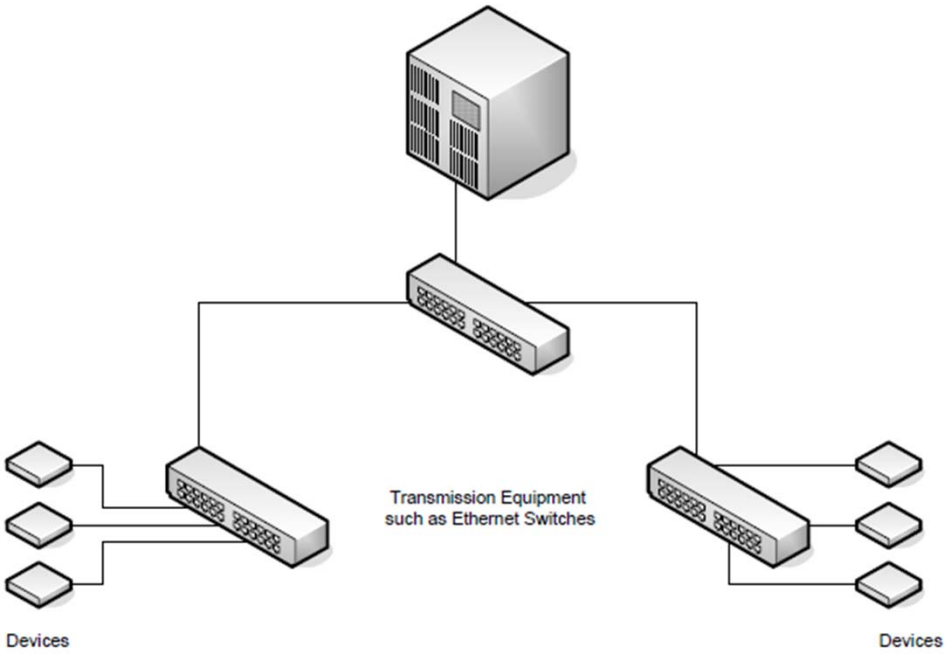
NFPA-72 2016 Key Changes

Message Templates

"Attention [floors 9, 10, and 11]. This is your [Building Safety Officer, Joe Smith]. A fire has been reported on the [10th floor] of the building. Everyone on the [9th, 10th, and 11th floors] should move to the [8th floor] to be protected from heat and smoke, since heat and smoke can creep into nearby floors during a fire. Use the stairs immediately. Do not use the elevators. Those who need help getting to the [8th floor], please wait inside the stairwell."

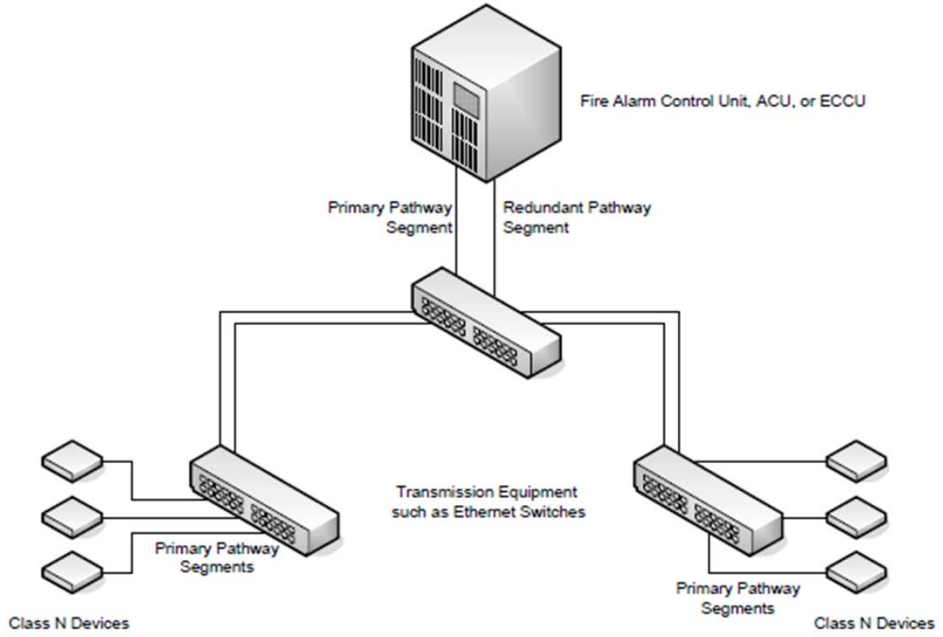
NFPA-72 2016 Key Changes

Ethernet Block Diagram



NFPA-72 2016 Key Changes

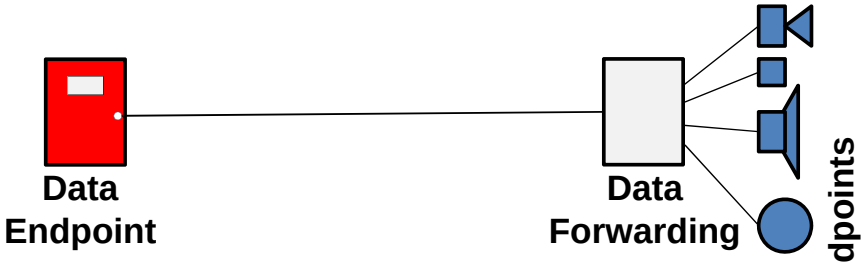
Class N Block Diagram



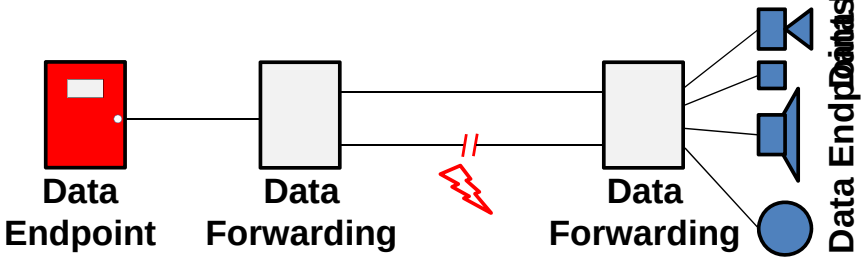
NFPA-72 2016 Key Changes

Networks Ground Faults or Breaks

Network devices can be categorized in two basic categories:
Data Endpoints and
Data Forwarding Equipment



Class N paths require alternate communication pathways where more than one device would be impacted by a fault



NFPA-72 2016 Key Changes

Mass Notification is now referred to as the Emergency Communications System (ECS)

ECS

The ECS Layers

VOICE

VISUAL

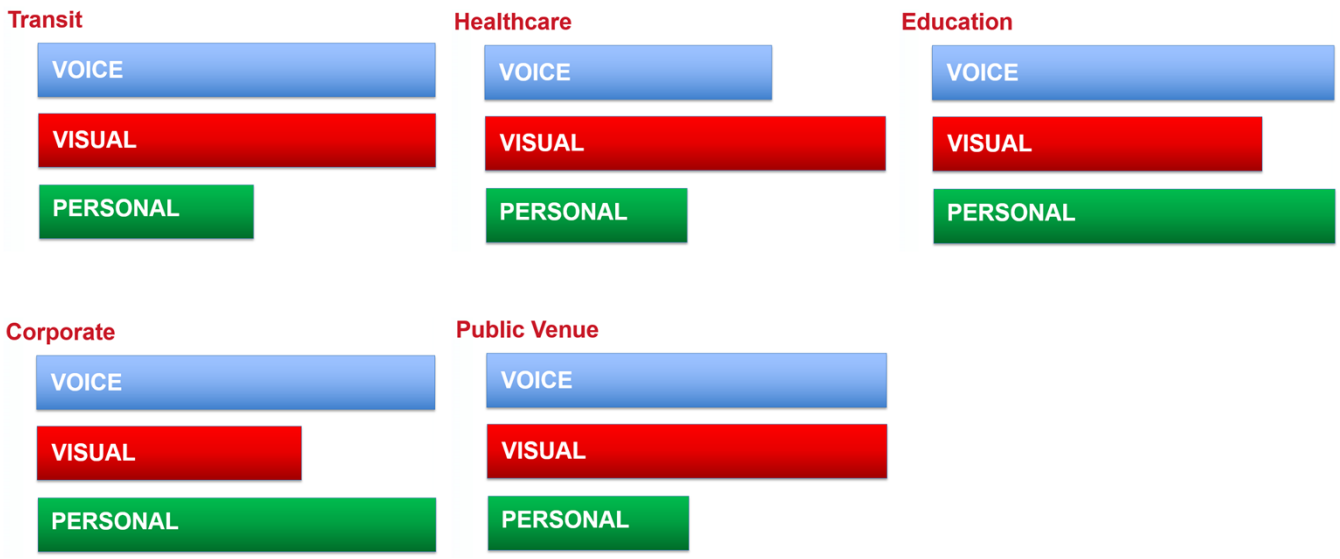
PERSONAL

ECS

Every facility utilizes the layers differently as the population within that building have different communication needs

Five vertical markets have been defined to illustrate the different usages of the layers

Example ECS Layer Usage



The Integrated ECS

Remember the NFPA page templates?

- Disparate and autonomous systems are brought together to achieve a common goal
- Each system has a different level of priority depending upon the facility and the application of the ECS layers
- Automation is used to simplify the complex tasks required during the crisis

The Integrated ECS

The Process

- Risk Analysis/Risk Vulnerability Assessment
- Emergency Response Plan/Crisis Intervention Plan
- Requirements reside within CSI Divisions 25, 27, or 28

The Integrated ECS

Physical Security Information Management

- OnSSI
- CNL
- IronYUN
- Qognify
- Genetec

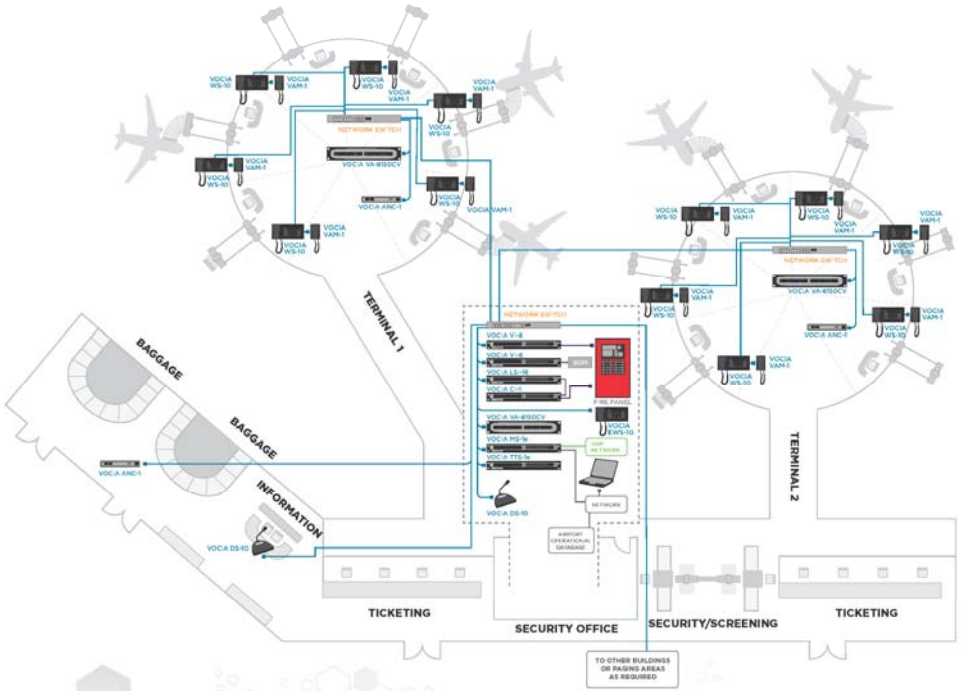
SYSTEM DESIGN GUIDE

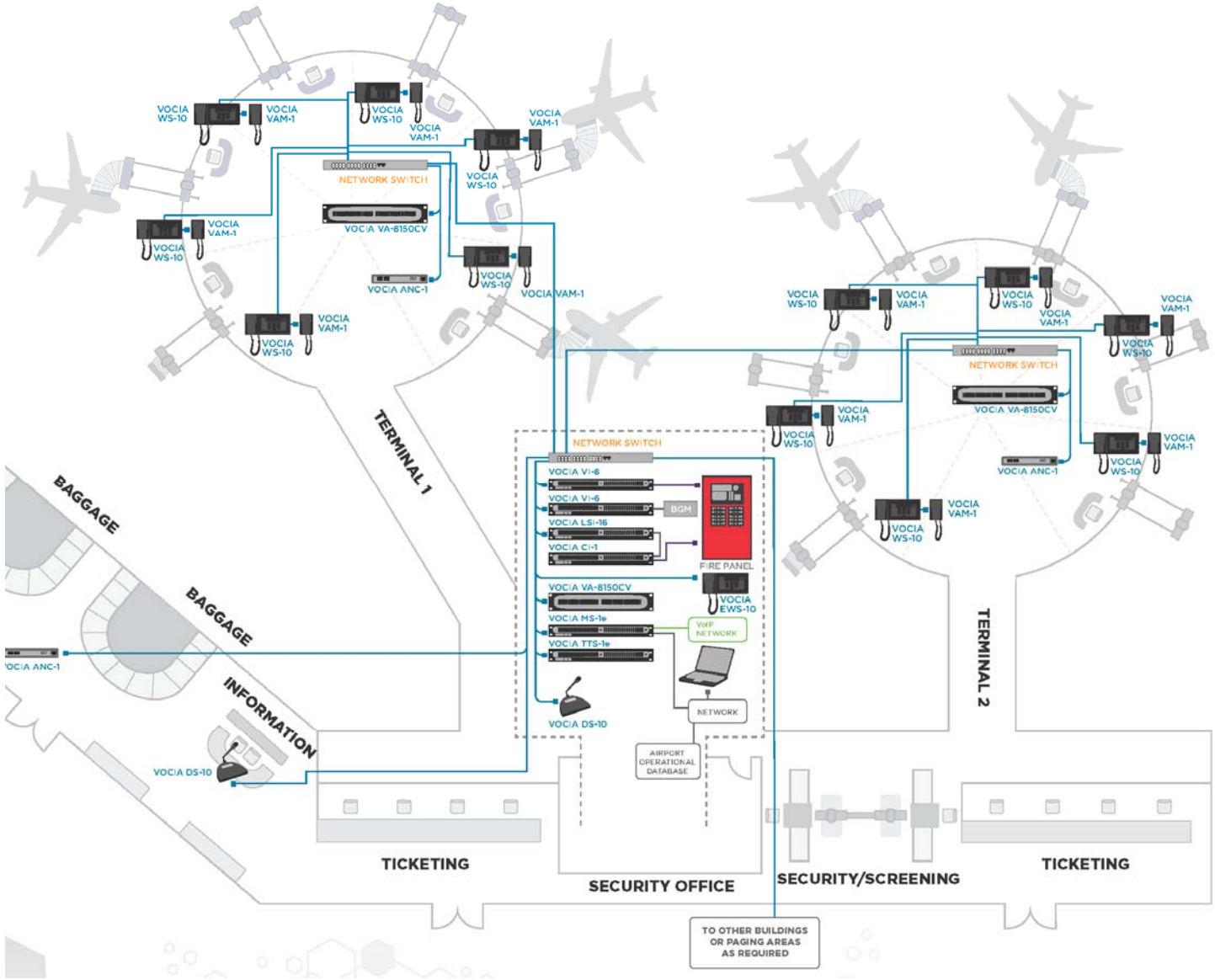
REGIONAL AIRPORT

Vocia is EN-54 certified as well as NFPA 72-2016 compliant, and serves as the hub for all paging and emergency system support needs. Integrating paging with ambient noise compensation hardware allows the paging volume to adjust automatically to the space's ambient volume, thus ensuring pages are audible and intelligible, which is crucial in times of emergency. In addition, Vocia's Text-to-Speech Server (TTS-1e) functionality provides greater options for creating messages from simple text. Vocia also has the ability to interface with the Airport Operational Database, allowing announcements from other systems like Flight Information Display Systems (FIDS) and Building Management Systems (BMS). Visit support.biamp.com for more information.

VOCIA FEATURES

- Scalable to grow with a facility's needs
- Decentralized networking with no single point of failure
- Install or replace Vocia hardware without taking the system offline
- Standard paging and critical paging in one platform
- Adjusts the page volume based on the ambient noise in that zone




VOCIA WS-10
VOCIA VAM-1
NETWORK SWITCH
VOCIA VA-8150CV
VOCIA ANC-1
TERMINAL 1
TERMINAL 2
BAGGAGE
BAGGAGE
INFORMATION
VOCIA VI-8
VOCIA VI-6
VOCIA LSI-16
VOCIA CI-1
BGM
FIRE PANEL
VOCIA EWS-10
VOCIA MS-1e
VOCIA TTS-1e
VoIP NETWORK
NETWORK
VOCIA DS-10
AIRPORT OPERATIONAL DATABASE
TICKETING
SECURITY OFFICE
SECURITY/SCREENING
TICKETING
TO OTHER BUILDINGS OR PAGING AREAS AS REQUIRED

Questions

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