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Best Practices for Incoming Call Recovery

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There are 3 steps to a successful telecommunications recovery after a disaster or other outage:

Diversion: To divert incoming calls around the failure point and toward another destination. Examples of common diversion tools: call forwarding a local number, re-pointing a toll-free number. The “best practice” would include the capability of diverting during all possible failures, including catastrophic carrier failures.

Control: To establish real-time control of the diverted calls and enable rapid adaptability to unforeseen obstacles, with the goal of providing a professional experience for callers during all types of outages.

Delivery: To first exhaust all possible means—creatively using both existing and new technologies—of connecting callers live to the originally intended parties, and if unsuccessful, automatically (and seamlessly to the caller) attempting delivery to the next best option, then the next best, and so forth, with a final fail-over to voicemail and/or recorded announcements.

This paper will explore the “best practices” within these three steps in some detail, and how they can be used to provide a surprisingly effective and professional recovery for incoming calls during even the most severe outages and disasters.

STEP 1: DIVERSION (also called a “Trigger”)

Though there are unlimited possible causes of outages, physically there are only six potential failure points—the 6 Vulnerabilities—that require protection to mitigate any outage that can occur:

1. Equipment failure (hardware or software failure of PBX/phone system)
2. Power failure
3. Last mile (cable cut or other problem with the connection to the carrier)
4. Local carrier failure/congestion (affects local numbers)
5. Long distance carrier failure/congestion (affects toll-free numbers)
6. Evacuation or quarantine

When an outage occurs due to one or more of these vulnerabilities, the first step in recovering service (of three total steps) is to divert incoming calls away from the problem.

There are several methods of diverting calls. The best method to use depends upon which of the 6 Vulnerabilities has been compromised. Refer to the table below for the best diversion method (“trigger”) for each vulnerability.

Outage Trigger / Method

		Local Numbers	Switched Toll-Free	Dedicated Toll-Free
Vulnerability:	Equipment	Call forward	Local carrier forward, LD carrier re-point, or TFN Recovery™	TFN Recovery™
	Power	Call forward	Local carrier forward, LD carrier re-point, or TFN Recovery™	TFN Recovery™
	Last mile	Call forward	Local carrier forward, LD carrier re-point, or TFN Recovery™	TFN Recovery™
	Local Carrier	Call forward or Quick Port	LD carrier re-point or TFN Recovery™	TFN Recovery™
	LD Carrier	(not necessary)	TFN Recovery™	TFN Recovery™
	Evacuation	Call forward	Local carrier forward, LD carrier re-point, or TFN Recovery™	TFN Recovery™

Call forward: Diversion of local phone numbers (entire trunk groups, specific DIDs, POTS, Centrex, etc.) to other 10-digit phone numbers is performed by the local carrier (or SIP Provider). It is typically triggered by dialing into an automated system with a PIN, opening a ticket with the repair department or logging into an online portal. With some carriers and with certain types of outages, the call forward can be triggered automatically. Many carriers can forward even with a Central Office failure. If a toll-free number is pointed to a local number that has been forwarded, the toll-free calls will follow the forwarding path.

Quick Port: A batch of local phone numbers can be quickly ported (moved) from one Central Office to any other, either within the same carrier's network or to another, and quickly moved back after an outage is over.

LD carrier re-point: The long distance carrier of a toll-free number can re-point (or "re-terminate") a toll-free number to any non-toll-free 10-digit number or to a different dedicated trunk group within the same carrier. Re-pointing a switched toll-free number is typically much faster than re-pointing a dedicated number. With some carriers either or both can be re-pointed by the end user through an online portal.

TFN Recovery™: With TFN Recovery™ toll-free service can be rapidly and temporarily diverted away from failed or unresponsive long distance carriers, without requiring the current carrier to re-point the numbers. TFN Recovery™ is possible even if current carriers are inaccessible and/or completely inoperable.

The Final Option: A Toll-Free Hotline

The possibility exists of a catastrophic outage where local numbers cannot be recovered for days or even weeks (unless Quick Port has been established ahead of time). To mitigate the impact of such an outage, every organization should establish a toll-free hotline, using either a new toll-free number or an existing one. Calls to a toll-free hotline can completely circumvent any carriers, equipment, and other facilities in your geography, and so are resistant to even catastrophic events.

DID Recovery™ using a Toll-Free Hotline: A Toll-Free Hotline can also be utilized to recover DID functionality for an unlimited number of DIDs. DID Recovery™ via hotline will work without any call forwarding by the local carrier and can provide recovery during even the most catastrophic events.

Step 2: Control.

STEP 2: CONTROL

Diverted calls must land at a backup system of some kind, somewhere, ideally where full real-time control can be re-established. At a minimum the backup system should have the following characteristics:

- Ample capacity
- Physical distance from your geography
- Network diversity (multiple carriers, PSTN and VoIP, etc.)
- Ability to receive and store voicemail
- Ability to receive and store faxes

Optimally, the system should also have the following capabilities:

- The ability to first attempt delivery into existing equipment, before mimicking that equipment itself (transparency)
- Ability to deliver live calls to any useable connection (cellular, land, internet, satellite, etc.)
- Hunting/overflow between multiple locations
- Real-time remote add/move/change control without disconnecting callers
- Separate treatment for different phone numbers (DID/TFN detection and routing)
- Call queuing with call distribution to multiple destinations before failing over to voicemail/announcements
- Dial-by-name/extension directories
- Ability to rapidly and remotely re-record all prompts/greetings, even if a microphone or telephone is not readily available
- Real-time reporting

Once control over diverted calls is established, callers can enjoy a professional experience even in the midst of a massive outage, with appropriate greetings, options, and/or other information, and live delivery can be attempted at myriad destinations.

To ensure the best possible experience for callers no matter the outage, go to Step 3: Delivery.

STEP 3: DELIVERY

With proper control established there are many possibilities of what to do with recovered calls, especially with Teleira's **VoiceShield** Web Call Controller™. There are certainly also some best practices that can guide a recovery to its best, most professional outcome.

The Call Delivery Ladder™

Teleira's "Call Delivery Ladder" (below) provides a best-practices guideline for enabling the best, most professional experience possible for callers during a telecom outage. The object of the ladder is to keep callers as close to #1 as possible, and automatically fail over to #2 only if #1 has been attempted and/or is not possible. If #2 is not possible, then automatically fail over to #3, and so forth.

1. Deliver calls into same equipment through another path
2. Live calls to same people/departments through another path
3. Live calls to other people, departments, locations

5. Announcement

Rung #1: Deliver calls into same equipment through another path

The ideal recovery from an outage is live call delivery into the same equipment through another path, so that callers are completely unaware of any problems. Of course, this isn't possible if the equipment itself is the cause of the outage, a time when the recovery must start at the next rung down the ladder. For all other vulnerabilities—power, last mile, local and LD carrier failures—every creative means available to deliver calls back into existing equipment should be exhausted before failing over to other recovery options.

Teleira has discovered or developed several different methods of effectively delivering calls back into existing equipment:

Installed POTS lines* (analog/copper/centrex, etc.)

Installed alternate carriers

Through existing private network (starting at another location)

VoiceShield NetPRI (uses existing public internet connection to deliver PRI, analog, T1, or SIP signaling to existing equipment)

VoiceShield Satellite (uses pre-configured satellite to deliver PRI, analog, T1, or SIP signaling to existing equipment)

*If calls routed to POTS lines can only be answered with special phones that are limited in functionality and/or are outside of the primary call handling system, it may be best to use them as extensions accessed by a Call Tree within Rung #2 rather than forwarding calls directly to them. See Rung #2 for examples/ideas.

Rung #2: Deliver live calls to the same people/departments through another path

Using the **VoiceShield** Web Call Controller™, calls can be delivered live anywhere over POTS lines, mobile phones, home phones, VoIP over any available internet connection, hand-held satellite phones, and more.

For main numbers and departmental DIDs the goal is to provide a simple, consistent and professional experience until the call can be connected live to the right person on an alternate phone of some kind, somewhere. This can be accomplished with various tools and features, such as:

Unlimited auto attendants with custom greetings, after-hours functionality, security features

Unlimited levels of customizable menus

Call distribution with music on hold, call screening, whisper announcements, etc.

Overflow between queues, jumping between call trees

Simple hunt/overflow across unlimited locations

Toll-Free DNIS detection that skips menus and goes straight to queues

For personal DIDs, one of two options are appropriate:

1. The call is directly routed to the individual's mobile phone, home phone, VoIP number, etc., or multiple numbers can be automatically attempted (find/follow feature) before failing over to backup voicemail.
2. The caller will first go to a menu and be prompted to choose an appropriate option, such as dial by department, by name, dial by extension, re-entering the DID, etc., then the call goes to #1.

if we receive the digits, we can route on them, if not, we have to divert the call to a default feature that gives the caller further options and/or information.

Rung #3: Deliver live calls to other people, departments, or locations

If Rung #2 is unsuccessful, the same tools and features can be used to have calls seamlessly fail over to other people, departments, and/or locations. Here are a few examples of seamless fail-over from Rung #2 to Rung #3:

Within the same call distribution queue, the “right” people have a priority of 1 or 2, whereas “other” people at other locations have a lower priority and will only receive calls that those at a higher priority do not answer; the caller simply hears music while in queue and has no idea about the route progression behind the scenes.

When the max timeout in a call distribution queue is reached, the call automatically jumps to a simple forward feature that delivers the call to the “other” location.

When a personal DID is dialed, the call progresses through a find/follow feature that attempts the “right” individual first, at each of his/her specific numbers, then progresses through any number of additional numbers at any location. Calls “hunt” between alternate branches or locations, giving each location a short period of time to answer the call.

Rung #4: Voicemail

Rungs 1 through 3 of the Call Delivery Ladder offer the best chance of a live connection between the caller and the best employee available to take a call. If these options are unsuccessful it is still possible to establish two-way communication—though delayed—by using backup voicemail. **VoiceShield** includes an unlimited number of backup voicemail boxes, creatable in real-time on-the-fly, and completely customizable. Additional voicemail features include:

- Custom, name, or default greetings

- Recording Wizard for creating custom greetings from any phone

- Text to speech in multiple voices and languages (for when a phone is unavailable to record a greeting)

- PIN-protected instant remote access to messages by phone or online

- Immediate delivery of messages to multiple email addresses (as .wav file attachments)

- Full remote administrative access

Rung #5: Play an announcement

There are times, and possibly specific phone numbers, where the best alternative—or the final option—is to play to the caller an informative, reassuring announcement, either for a specific department or generally. With **VoiceShield** the use of announcements can be quite flexible:

- Recording Wizard for creating custom recordings from any phone, anywhere (enables key executives and other figureheads to easily make the recordings)

- Text to speech in multiple voices and languages (for when a phone is unavailable to record the announcement)

- General, department-specific, or phone number-specific announcements

- Announcements can be used as a final fail-over option, as an introductory greeting, or in-between

- With the Toll-Free Hotline an unlimited selection of announcements can be made available to callers, with different instructions, for different departments, for the media, for employees, for executives, in different languages, and more

- Individual or entire groups of announcements can be PIN-protected so that only appropriate individuals can access them