Technical Guide: Network Circumvention Methods in Total Infrastructure Shutdowns

Part 1: Mesh Networking

An educational overview of technical approaches for communication in restricted network environments

1. Mesh Networking (Decentralized Communication)

Technology: Device-to-device communication via Bluetooth/WiFi Direct

Mesh networks create peer-to-peer connections between devices, allowing messages to "hop" from one device to another without requiring internet infrastructure or cellular towers. Each device acts as both a node and a relay point.

TOOLS & DOWNLOAD LINKS

1.1 Briar - Most Secure Option

Download:

- Official: https://briarproject.org/download-briar/
- F-Droid: https://f-droid.org/packages/org.briarproject.briar.android/
- APK Direct: https://briarproject.org/apk/

Features:

- End-to-end encrypted messaging
- Works via Bluetooth, WiFi Direct, and Tor
- No phone number or email required
- Completely decentralized
- Forum and blog capabilities

Step-by-Step Setup:

1. Download Briar APK to Android device
2. Install (Allow installation from unknown sources if needed)
3. Open Briar
4. Create strong password (write it down - cannot be recovered)
5. Write down your recovery phrase (critical for backup)
6. Go to Settings > Enable Bluetooth
7. Go to Settings > Enable WiFi Direct
8. Add contacts by scanning QR code in person (most secure) or sharing contact link
9. Messages automatically sync when devices are in range

Usage Tips:

- Keep Bluetooth always enabled for automatic syncing
- Battery usage is moderate (expect 15-20% extra drain)
- Best range: 10-100 meters depending on obstacles
- Works even if both phones are offline

1.2 Bridgefy - Easy to Use

Download:

- Google Play: https://play.google.com/store/apps/details?id=me.bridgefy.main
- Official Site: https://bridgefy.me/
- iOS: https://apps.apple.com/app/bridgefy/id975776347

Features:

- Bluetooth mesh with up to 330 feet (100m) range
- Multi-hop: Messages bounce through multiple devices
- Works on both Android and iOS
- Broadcasts to all nearby users or private messaging
- No registration required

Step-by-Step Setup:

1. Download Bridgefy from official store
2. Install and open app
3. Grant Bluetooth and Location permissions
4. Create username (no phone number needed)
5. Enable 'Broadcast Mode' for public messages or add contacts for private encrypted messages
6. App automatically finds nearby Bridgefy users
7. Send messages - they hop through network automatically

Advanced Features:

- **Broadcast Mode:** Send to everyone in mesh (useful for announcements)
- **Private Mode:** End-to-end encrypted one-on-one chats
- **Mesh Distance:** Messages can travel through 10+ device hops
- **Offline Maps:** Share location without GPS

Usage Notes:

- More users = better coverage
- Keep app open in background
- Battery drain: ~20-30% per day with constant use

1.3 FireChat - Mass Communication

Download:

- Android APK: https://firechat.en.uptodown.com/android
- Note: Removed from official stores but APK available

Features:

- Public chatrooms
- Private messaging
- No internet/cellular required
- Anonymous usage option
- Used successfully in Hong Kong protests (2014)

Step-by-Step Setup:

1. Download FireChat APK from trusted source
2. Install (enable unknown sources)
3. Open app and create username
4. Enable Bluetooth and WiFi
5. Join public channels or create private chats
6. Messages propagate through nearby devices

Best Use Cases:

- Large gatherings (protests, events)
- Public announcements
- Emergency coordination
- Mass communication in blackouts

1.4 Serval Mesh - Advanced Option

Download:

- Official: http://www.servalproject.org/download/
- F-Droid: https://f-droid.org/packages/org.servalproject/
- GitHub: https://github.com/servalproject/

Features:

- WiFi Direct mesh networking
- Voice calls over mesh
- File sharing
- SMS-like messaging
- Designed for disaster scenarios

Step-by-Step Setup:

1. Download Serval Mesh Extender app
2. Install on Android device (requires Android 4.0+)
3. Open app and agree to permissions
4. Phone automatically creates mesh network
5. Discover nearby Serval devices
6. Start messaging or voice calls
7. Share files directly device-to-device

Technical Details:

- Uses WiFi ad-hoc mode or WiFi Direct
- Range: 50-200 meters depending on device
- Supports mesh phone calls (voice over WiFi mesh)
- Can be extended with Serval Mesh Extender hardware

PRACTICAL IMPLEMENTATION GUIDE

Step 1: Pre-Shutdown Preparation

Before internet shutdown occurs:

1. Download all mesh apps (multiple options for redundancy)
2. Install on multiple devices
3. Test with friends/family
4. Create contact connections
5. Share apps via Bluetooth with community
6. Print QR codes for Briar contacts

Step 2: Optimal Device Placement

For maximum coverage:

- Place devices in windows (better signal propagation)
- Create stationary relay nodes (old phones left on)
- Position devices at 80-100m intervals
- Elevate devices when possible (reduces obstacles)
- Use power banks to keep relay nodes running

Step 3: Network Expansion

Build your mesh network:

1. Distribute apps to community members
2. Create relay chains across neighborhoods
3. Designate 'hub' locations with multiple devices
4. Establish message forwarding protocols
5. Use broadcast for urgent announcements
6. Private channels for sensitive coordination

Step 4: Operational Security

Stay safe while using mesh:

- Use pseudonyms, not real names
- Don't include identifying information in messages
- Assume all messages could be intercepted
- Use Briar for most sensitive communications (best encryption)
- Keep devices on airplane mode when not actively communicating

- Remove metadata from shared photos/files

TECHNICAL SPECIFICATIONS

App	Max Single Hop	Multi-Hop	Max Range
Briar	10-100m (BT)	Yes	Unlimited with nodes
Bridgefy	100m (BT)	Yes (10+ hops)	1+ km with nodes
FireChat	70m (BT/WiFi)	Yes	Unlimited with nodes
Serval	50-200m (WiFi)	Yes	2+ km with setup

Battery Consumption:

- Briar: 15-20% extra per day (moderate use)
- Bridgefy: 20-30% per day (active use)
- FireChat: 25-35% per day (constant connection)
- Serval: 30-40% per day (WiFi Direct drains more)

Platform Support:

- Briar: Android only
- Bridgefy: Android + iOS
- FireChat: Android + iOS
- Serval: Android only

REAL-WORLD DEPLOYMENT SCENARIOS

Scenario 1: Neighborhood Network

Setup: 50 households in 1 sq km area
Devices: Each household has 1-2 Android devices with Bridgefy
Coverage: Messages can reach entire neighborhood in 2-5 minutes
Use: Coordination, information sharing, emergency alerts

Scenario 2: Protest Coordination

Setup: 1000+ people in city square
Devices: Mix of Bridgefy (broadcast) + Briar (secure comms)
Coverage: Real-time updates across entire gathering
Use: Movement coordination, safety alerts, avoid authorities

Scenario 3: City-Wide Network

Setup: Strategic relay nodes at key locations
Devices: Old smartphones as permanent relay points
Coverage: Messages traverse city in 10-30 minutes
Use: Inter-district communication, news distribution

TROUBLESHOOTING COMMON ISSUES

Problem: Devices not discovering each other

Solution:

1. Verify Bluetooth is enabled on both devices
2. Enable Location permissions (required for Bluetooth scanning)
3. Move devices closer (< 10 meters for initial pairing)
4. Restart app
5. Toggle Bluetooth off/on

Problem: Messages not reaching destination

Solution:

1. Check if devices are within range
2. Verify enough relay nodes between sender/receiver
3. Keep app running in background
4. Check battery saver isn't killing app
5. Ensure WiFi Direct is enabled (for some apps)

Problem: High battery drain

Solution:

1. Close unnecessary background apps
2. Lower screen brightness
3. Use power saving mode (but keep Bluetooth active)
4. Carry power bank
5. Disable WiFi scanning when using Bluetooth-only mode

ADDITIONAL RESOURCES

Documentation:

- Briar Manual: https://briarproject.org/manual/
- Bridgefy Help: https://bridgefy.me/help/
- Serval Documentation: http://developer.servalproject.org/

Community Support:

- Briar Forum: https://forum.briarproject.org/
- Reddit r/meshnetworks: https://reddit.com/r/meshnetworks

Video Tutorials:

- Search YouTube: 'Briar mesh messaging tutorial'
- Search YouTube: 'Bridgefy offline messaging'

KEY TAKEAWAYS

✓ Mesh networks work without internet or cellular

✓ Easy to set up - 5 minutes per device

✓ More users = better coverage

✓ Briar most secure, Bridgefy easiest

✓ Download and test BEFORE shutdown

✓ Keep devices charged and apps running

✓ Share with community to build network

Next in Series: Part 2 - Exploiting White List Accounts