

STANDAR OPERASIONAL PROSEDUR

PENGELOLAAN WI-FI KAMPUS

DOKUMEN SOP

Nomor SOP 011/PPTIK/SOP/2024
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Tanggal Revisi 01 Desember 2024
Tanggal Efektif 01 Januari 2025
Edisi/Revisi 01
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UNIVERSITAS MUHAMMADIYAH MATARAM

PUSAT PENGEMBANGAN TEKNOLOGI INFORMASI DAN KOMUNIKASI (PPTIK)

Terakreditasi B

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LEMBAR PENGESAHAN

Jabatan	Nama	Tanda Tangan	Tanggal
Dibuat			/...../2024
oleh: Network Administrator	...		
Diperiksa			/...../2024
oleh: Koordinator Jaringan	...		
Disahkan			/...../2024
oleh: Kepala PPTIK	...		

1. TUJUAN

Prosedur ini bertujuan untuk: 1. Menyediakan layanan Wi-Fi berkualitas tinggi di seluruh area kampus 2. Mengimplementasikan wireless security best practices 3. Mendukung peningkatan jumlah perangkat mobile (BYOD) 4. Mengoptimalkan pengalaman pengguna dengan roaming seamless 5. Memenuhi kebutuhan bandwidth untuk pembelajaran digital

2. RUANG LINGKUP

SOP ini mencakup: - Pengelolaan Wireless LAN Controller (WLC) - Manajemen Access Point (AP) enterprise - Implementasi 802.1X authentication dan RADIUS - Captive portal untuk guest access - Wireless Intrusion Prevention System (WIPS) - RF optimization dan site survey - User management dan bandwidth control

3. DEFINISI

<i>Istilah</i>	<i>Definisi</i>
WLC	<i>Wireless LAN Controller, pengendali terpusat untuk AP</i>
AP	<i>Access Point, perangkat pemancar sinyal Wi-Fi</i>
SSID	<i>Service Set Identifier, nama jaringan Wi-Fi</i>
802.1X	<i>Standar autentikasi berbasis port (EAP)</i>
RADIUS	<i>Remote Authentication Dial-In User Service</i>
Captive Portal	<i>Halaman login untuk akses guest</i>
WIPS	<i>Wireless Intrusion Prevention System</i>
Roaming	<i>Perpindahan seamless antar AP</i>
802.11ax	<i>Wi-Fi 6, standar wireless terbaru</i>

4. REFERENSI

- UU No. 11 Tahun 2008 jo. UU No. 19 Tahun 2016 tentang ITE*
- UU No. 27 Tahun 2022 tentang Perlindungan Data Pribadi*
- IEEE 802.11 Wireless LAN Standards*
- WPA3 Security Specification*
- Best Practice Enterprise Wireless Deployment*

5. PENANGGUNG JAWAB

<i>No</i>	<i>Jabatan</i>	<i>Tanggung Jawab</i>
1	<i>Kepala PPTIK</i>	<i>Policy approval</i>
2	<i>Koordinator Jaringan</i>	<i>Oversight dan planning</i>
3	<i>Wireless Administrator</i>	<i>Konfigurasi dan optimasi</i>
4	<i>Network Administrator</i>	<i>Support infrastructure</i>
5	<i>Security Analyst</i>	<i>Wireless security</i>
6	<i>Network Technician</i>	<i>Instalasi fisik AP</i>

6. ARSITEKTUR WIRELESS

6.1 SSID & Segmentasi

<i>SSID</i>	<i>Target User</i>	<i>Auth Method</i>	<i>VLAN</i>	<i>Bandwidth/User</i>
UMMAT - EDURO AM	Dosen, Staff, Mahasiswa	802.1X (eduroam)	100	500 Mbps
UMMAT -STAFF	Dosen dan Staff	802.1X + Certificate	110	200 Mbps
UMMAT - STUDE NT	Mahasiswa	802.1X + Password	120	300 Mbps
UMMAT -IOT	IoT Devices	MAC Auth	130	100 Mbps
UMMAT -GUEST	Tamu	Captive Portal + OTP	140	100 Mbps
UMMAT -EVENT	Event/Seminar	Temporary PSK	150	100 Mbps

6.2 Security Standards

<i>Security</i>	<i>Specification</i>
Encryption	WPA3-Enterprise (preferred), WPA2-Enterprise
Authentication	802.1X with EAP-TLS/PEAP
RADIUS Server	Redundant RADIUS dengan failover
Certificate	Valid TLS certificate untuk RADIUS
Guest Isolation	Client isolation enabled

7. PROSEDUR

7.1 Instalasi Access Point Baru

<i>No</i>	<i>Aktivitas</i>	<i>Pelaksana</i>	<i>Waktu</i>	<i>Output</i>	<i>Dokumen</i>
1	Request AP baru dengan justifikasi	Pemohon	-	Request Form	FM_NET_057
2	Site survey untuk RF analysis	Wireless Admin	1 hari	Survey Report	FM_NET_058
3	Determine optimal placement	Wireless Admin	1 jam	Placement Plan	FM_NET_058
4	Approval pengadaan/instalasi	Koordinator	3 hari	Approval	FM_NET_057

No	Aktivitas	Pelaksana	Waktu	Output	Dokumen
5	Physical installation dan cabling	Network Tech	4 jam	AP Installed	FM_NET_059
6	Register AP ke WLC	Wireless Admin	30 menit	AP Registered	-
7	Configure AP profile	Wireless Admin	30 menit	Configured	FM_NET_060
8	RF tuning (channel, power)	Wireless Admin	1 jam	Optimized	FM_NET_060
9	Testing coverage dan performance	Wireless Admin	2 jam	Test Result	FM_NET_061
10	Update documentation	Wireless Admin	30 menit	Documented	FM_NET_062

7.2 User Onboarding (802.1X)

No	Aktivitas	Pelaksana	Waktu	Output	Dokumen
1	User register akun SSO	User	Self-service	Account	-
2	Verify identity via SIAKAD/HRIS	Automated	Real-time	Verified	-
3	Provision credentials ke RADIUS	Automated	Real-time	Provisioned	-
4	User download certificate (staff)	User	Self-service	Certificate	FM_NET_063
5	Configure device untuk 802.1X	User/Helpdesk	15 menit	Configured	FM_NET_063
6	Test connection	User	5 menit	Connected	-

7.3 Guest Access Management

No	Aktivitas	Pelaksana	Waktu	Output	Dokumen
1	Request guest access	Host/Sponsor	-	Request	FM_NET_064
2	Sponsor approval	Department Head	1 hari	Approved	FM_NET_064
3	Generate guest credentials	System/Admin	Auto/5 menit	Credentials	FM_NET_065
4	Guest login via captive portal	Guest	Self-service	Authenticated	-
5	OTP verification via SMS/Email	Guest	Self-service	Verified	-

<i>No</i>	<i>Aktivitas</i>	<i>Pelaksana</i>	<i>Waktu</i>	<i>Output</i>	<i>Dokumen</i>
6	<i>Access granted with time limit</i>	<i>System</i>	<i>Auto</i>	<i>Access</i>	-
7	<i>Access auto-expired</i>	<i>System</i>	<i>Auto</i>	<i>Expired</i>	-

7.4 Wireless Security Monitoring

<i>No</i>	<i>Aktivitas</i>	<i>Pelaksana</i>	<i>Frekuensi</i>	<i>Output</i>	<i>Dokumen</i>
1	<i>WIPS alert monitoring</i>	<i>Security Analyst</i>	<i>24/7</i>	<i>Alert Log</i>	<i>FM_NET_066</i>
2	<i>Rogue AP detection</i>	<i>WIPS</i>	<i>Continuous</i>	<i>Rogue List</i>	<i>FM_NET_066</i>
3	<i>Rogue AP investigation</i>	<i>Wireless Admin</i>	<i>Per alert</i>	<i>Investigation</i>	<i>FM_NET_067</i>
4	<i>Rogue AP containment/removal</i>	<i>Wireless Admin</i>	<i>ASAP</i>	<i>Contained</i>	<i>FM_NET_067</i>
5	<i>Wireless vulnerability scan</i>	<i>Security Analyst</i>	<i>Monthly</i>	<i>Scan Report</i>	<i>FM_NET_068</i>
6	<i>Review auth failures</i>	<i>Security Analyst</i>	<i>Daily</i>	<i>Analysis</i>	<i>FM_NET_069</i>
7	<i>Identify suspicious patterns</i>	<i>Security Analyst</i>	<i>Weekly</i>	<i>Report</i>	<i>FM_NET_069</i>

7.5 RF Optimization

<i>No</i>	<i>Aktivitas</i>	<i>Pelaksana</i>	<i>Frekuensi</i>	<i>Output</i>	<i>Dokumen</i>
1	<i>Monitor channel utilization</i>	<i>Wireless Admin</i>	<i>Weekly</i>	<i>Utilization</i>	-
2	<i>Analyze interference</i>	<i>Wireless Admin</i>	<i>Monthly</i>	<i>Interference Map</i>	<i>FM_NET_070</i>
3	<i>Adjust channel assignments</i>	<i>Wireless Admin</i>	<i>As needed</i>	<i>Optimized</i>	<i>FM_NET_070</i>
4	<i>Power level optimization</i>	<i>Wireless Admin</i>	<i>As needed</i>	<i>Optimized</i>	<i>FM_NET_070</i>
5	<i>Band steering configuration</i>	<i>Wireless Admin</i>	<i>Quarterly</i>	<i>Configured</i>	-
6	<i>Load balancing tuning</i>	<i>Wireless Admin</i>	<i>Quarterly</i>	<i>Balanced</i>	<i>FM_NET_070</i>
7	<i>Heat map</i>	<i>Wireless Admin</i>	<i>Semester</i>	<i>Heat Map</i>	<i>FM_NET_071</i>

<i>No</i>	<i>Aktivitas verification</i>	<i>Pelaksana</i>	<i>Frekuensi</i>	<i>Output</i>	<i>Dokumen</i>
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7.6 Maintenance & Updates

<i>No</i>	<i>Aktivitas</i>	<i>Pelaksana</i>	<i>Frekuensi</i>	<i>Output</i>	<i>Dokumen</i>
1	WLC firmware update	Wireless Admin	Quarterly	Updated	FM_NET_072
2	AP firmware update	Wireless Admin	Quarterly	Updated	FM_NET_072
3	Physical inspection AP	Network Tech	Monthly	Inspection	FM_NET_073
4	Replace faulty AP	Network Tech	As needed	Replaced	FM_NET_074
5	RADIUS certificate renewal	Security Analyst	Annual	Renewed	FM_NET_075
6	Password rotation (PSK networks)	Wireless Admin	Semester	Rotated	FM_NET_076

8. KEBIJAKAN PENGGUNAAN WI-FI

8.1 Acceptable Use

1. Wi-Fi kampus untuk keperluan akademik, penelitian, dan pekerjaan
2. User bertanggung jawab atas aktivitas dengan credentials mereka
3. BYOD diperbolehkan dengan mematuhi security policy
4. Bandwidth fair-use untuk semua pengguna

8.2 Prohibited Activities

1. Sharing credentials dengan pihak lain
2. Menggunakan Wi-Fi untuk aktivitas ilegal
3. Memasang unauthorized access point (rogue AP)
4. Melakukan network scanning/hacking
5. Mengakses konten terlarang

8.3 Enforcement

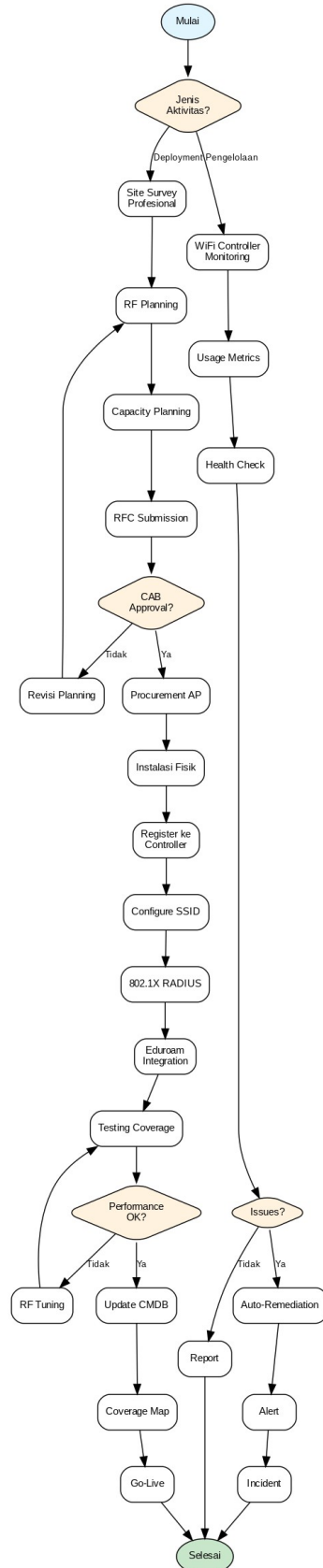
<i>Pelanggaran</i>	<i>Sanksi</i>	<i>Durasi</i>
Sharing password	Warning + password reset	-
Rogue AP	Immediate removal + warning	-
Bandwidth abuse	Throttle/suspend	7 hari
Illegal activity	Account suspended + report	Permanent

9. KEY PERFORMANCE INDICATORS

<i>KPI</i>	<i>Target</i>	<i>Pengukuran</i>
<i>Coverage Area</i>	<i>100% kampus</i>	<i>Annual survey</i>
<i>Connection Success Rate</i>	<i>≥ 95%</i>	<i>Daily</i>
<i>Average Throughput</i>	<i>≥ 80% of allocated</i>	<i>Weekly</i>
<i>Roaming Success</i>	<i>≥ 99%</i>	<i>Monthly</i>
<i>AP Availability</i>	<i>≥ 99.5%</i>	<i>Monthly</i>
<i>Security Incidents</i>	<i>0 breach</i>	<i>Annual</i>

10. FLOWCHART

SOP 011 - Pengelolaan WiFi Kampus v2.0



11. DOKUMEN TERKAIT

<i>Kode</i>	<i>Nama Form</i>	<i>Fungsi</i>
<i>FM_NET_057</i>	<i>Form Permintaan Access Point</i>	<i>Request AP baru</i>
<i>FM_NET_058</i>	<i>Form Site Survey Report</i>	<i>Hasil survey</i>
<i>FM_NET_059</i>	<i>Form AP Installation Checklist</i>	<i>Checklist instalasi</i>
<i>FM_NET_060</i>	<i>Form AP Configuration</i>	<i>Konfigurasi AP</i>
<i>FM_NET_061</i>	<i>Form Wireless Testing Result</i>	<i>Hasil testing</i>
<i>FM_NET_062</i>	<i>Form AP Documentation</i>	<i>Dokumentasi AP</i>
<i>FM_NET_063</i>	<i>Form 802.1X Onboarding Guide</i>	<i>Panduan user</i>
<i>FM_NET_064</i>	<i>Form Guest Access Request</i>	<i>Request guest</i>
<i>FM_NET_065</i>	<i>Form Guest Credentials</i>	<i>Credential guest</i>
<i>FM_NET_066</i>	<i>Form WIPS Alert Log</i>	<i>Log alert WIPS</i>
<i>FM_NET_067</i>	<i>Form Rogue AP Investigation</i>	<i>Investigasi rogue</i>
<i>FM_NET_068</i>	<i>Form Wireless Vulnerability Report</i>	<i>Vulnerability scan</i>
<i>FM_NET_069</i>	<i>Form Auth Failure Analysis</i>	<i>Analisis auth</i>
<i>FM_NET_070</i>	<i>Form RF Optimization Log</i>	<i>Log optimasi RF</i>
<i>FM_NET_071</i>	<i>Form Heat Map Report</i>	<i>Laporan heat map</i>
<i>FM_NET_072</i>	<i>Form Firmware Update Log</i>	<i>Log update</i>
<i>FM_NET_073</i>	<i>Form AP Physical Inspection</i>	<i>Inspeksi fisik</i>
<i>FM_NET_074</i>	<i>Form AP Replacement</i>	<i>Penggantian AP</i>
<i>FM_NET_075</i>	<i>Form Certificate Renewal</i>	<i>Renewal sertifikat</i>
<i>FM_NET_076</i>	<i>Form PSK Rotation Log</i>	<i>Rotasi password</i>

12. CATATAN REVISI

<i>Revisi</i>	<i>Tanggal</i>	<i>Uraian Perubahan</i>	<i>Oleh</i>
<i>00</i>	<i>15/12/2021</i>	<i>Dokumen awal</i>	<i>Tim PPTIK</i>
<i>01</i>	<i>01/12/2024</i>	<i>Penambahan: WLC management, 802.1X/RADIUS, eduroam, WIPS, RF optimization, guest management, BYOD policy, Wi-Fi 6 support</i>	<i>Tim PPTIK</i>

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